NMWR 9-2520-581

NATIONAL MAINTENANCE WORK REQUIREMENTS

FOR

HMMWV TRANSMISSION 3L80
NSN 2520-01-161-2136

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U.S. ARMY TANK-AUTOMOTIVE AND ARMAMENTS COMMAND

WARREN, MICHIGAN 48397-5000

As of March 21, 2003

WARNING SUMMARY

- Improper cleaning methods and use of unauthorized cleaning solutions may cause injury to personnel or damage to equipment. See TM 9-247 for correct information.
- Compressed air used for cleaning purposes will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc.).
- Do not use compressed air to dry bearings. Spinning a dry bearing with compressed air may cause injury to personnel or damage to equipment.
- Direct all personnel to stand clear during hoisting operations. Failure to do this may cause injury.
- When steam cleaning, protective clothing must be used. Failure to do this may cause injury.
- When sanding fiberglass, personal protective equipment (respirator, goggles/shield, gloves, coveralls, etc.) must be used. Failure to do this may cause injury.
- Do not operate heater in enclosed areas. Exhaust gases can kill. Make sure work area is well ventilated and exhaust fumes are routed away from test area.
- Drycleaning solvent is flammable and will not be used near an open flame. A fire extinguisher will be kept nearby when solvent is used. Use only in well-ventilated places. Failure to do this may result in injury to personnel or damage to equipment.

INSERT LATEST CHANGED PAGES / WORK PACKAGES, DESTROY SUPERSEDED DATA

LIST OF EFFECTIVE PAGES / WORK PACKAGES

NOTE: The portion of text affected by the changes is indicated by a vertical line in the outer margins of the page.

Dates if issue for original and changed pages / work packages are:

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NATIONAL MAINTENANCE WORK REQUIREMENTS

FOR

HMMWV TRANSMISSION 3L80

NSN 2520-01-161-2136

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this publication. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Submit your DA Form 2028 (Recommended Changes to Publications and Blank Forms), through the Internet, on the Army Electronic Product Support (AEPS) website. The Internet address is http://aeps.ria.army.mil. If you need a password, scroll down and click on "ACESS REQUEST FORM." The DA Form 2028 is located in the ONLINE FORMS PROCESSING section of the AEPS. Fill out the form and click on SUBMIT. Using this form on the AEPS will enable us to respond quicker to your comments and better manage the DA Form 2028 program. You may also mail, fax or E-mail your letter or DA Form 2028 direct to: AMSTA-LC-CI Tech Pubs, TACOM-RI, 1 Rock Island Arsenal, Rock Island, IL 61299-7630. The E-mail address is TACOM-TECH-PUBS@ria.army.mil. The fax number is DSN 793-0726 or Commercial (309) 782-0726.

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GENERAL INFORMATION 0001

THIS WORK PACKAGE (WP) COVERS:

Scope; Applicable Documents; Definitions; Transmission Repair Description; After Repair Performance Test; Disposal; Maintenance Forms, Records, and Reports; Reporting Equipment Improvement Recommendations (EIR); Corrosion Prevention and Control (CPC); Quality of Material; Engineering Change Proposals (ECP)

SCOPE

This NMWR covers the repair of the Hydra-Matic model THM-400 Transmission (3L80), NSN 2520-01-161-2136. This transmission assembly includes a torque converter. The transmission is used in the High Mobility Multipurpose Wheeled Vehicle (HMMWV).

APPLICABLE DOCUMENTS

Copies of the applicable documents can be received upon request by contacting:

Commodity Business Unit
USA TACOM
AMSTA-LC-CHL
Mcinernj@tacom.army.mil
Warren MI 48397-5000

The following documents form a part of this NMWR to the extent specified herein:

TM 9-2320-280-20-1
TM 9-2320-280-20-2
TM 9-2320-280-20-3
TM 9-2320-280-34
TM 9-2320-280-24P- 1
TM 9-2320-280-24P-2
TACOM Drawing Number 12339146

You may contact James Cole, Item Manager, e-mail address is: colej@tacom.army.mil.

DEFINITIONS

1. Repair: Restoring a component to its original performance condition, replacing parts as/if necessary.

2. OEM: The original equipment manufacturer. The company that originally manufactured, fabricated or supplied a transmission component or part. OEM may include items manufactured by a subcontractor for an original equipment manufacturer, provided that the name or trademark of the OEM is shown on the item, label, or container.

3. After Market Part: Any part or component that has been manufactured or fabricated by a company other than the original equipment manufacturer or their approved subcontractors and sold as a replacement part for an OEM part or component.

4. Serviceable Part: Any part that is capable of meeting or exceeding the minimum OEM standards for performing the function for which it was originally designed.

5. Non-serviceable Part: Any part that no longer meets minimum OEM standards.

TRANSMISSION REPAIR DESCRIPTION

1. We will provide transmission assemblies, NSN 2520-01-161-2136, in various states of disrepair. Some parts may be missing from the transmissions. You will repair the transmissions so that they meet the configuration of drawing 12339146 and the performance specifications described on **WP 0017**. This standard will provide a serviceable component, issuable to users without performance restrictions.

2. You can use OEM or equivalent after market repair parts when repairing the transmission. When using other than OEM parts, the parts used must be able to be repaired or replaced using the existing procedures, tools and repair parts specified in the HMMWV technical manuals.

3. Repaired transmission assemblies must maintain the same transmission-to-vehicle interface as the original equipment transmission.

4. Repair of cracks in the transmission case is limited to the bell housing area up to 3 inches away from the transmission oil pump face (see **WP 0006**). Any other crack is cause for disposal of the case. TACOM has provisioned the 3L80 case, NSN 3040-01-448-9611; it may be used in instances where the case cannot be repaired.

5. You may cannibalize serviceable or reparable parts from any unreparable transmission assembly for use when repairing other transmission assemblies.

6. During the course of repair, any sub-components/parts of the transmission assembly showing obvious signs of imminent failure, excessive wear, or deterioration will be replaced with a fully serviceable replacement.

7. The repaired transmission (including the torque converter) shall be free of contaminated oil.

GENERAL INFORMATION - Continued 0001

AFTER REPAIR PERFORMANCE TEST

You will do a performance test on each transmission repaired using equipment such as the AIDCO 450 Automatic Transmission Service Evaluation Center http://www.aidcoint.com/products_testst450.htm (or the equivalent). The Repair Facility Quality Representative and/or the Dynamometer Operator must witness the testing. As part of the performance test a Test Report should be kept at the Repair Facility for a minimum of two (2) years. A copy of the Repair Facility's monthly Production Report, to include the Manufacturers Serial Number of each repaired transmissions will be provided to colej@tacom.army.mil for tracking purposes. You will also attach a Repair Facility Data Plate of your design to the transmission.

Commander
USA TACOM
ATTN: AMSTA-LC-CHLC
Colej@tacom.army.mil
Warren, MI 48397-5000

We won't accept any transmissions until the repaired transmission passes the performance test.

DISPOSAL

You are responsible for disposal of any unrepairable or unused parts or assemblies.

MAINTENANCE FORMS, RECORDS, AND REPORTS

Department of the Army forms and procedures used for equipment will be those prescribed by (as applicable) DA PAM 738-750, Functional Users Manual for the Army Maintenance Management System (TAMMS); DA PAM 738-751, Functional Users Manual for the Army Maintenance Management - Aviation (TAMMS-A); or AR 700-138, Army Logistics Readiness and Sustainability.

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your transmission assembly, 3L80, NSN 2520-01-161-2136 needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Put it on an SF 368 (Product Quality Deficiency Report). Mail it to the address specified in DA PAM 738-750, Functional Users Manual for the Army Maintenance Management System (TAMMS), or as specified by the acquiring activity. We will send you a reply.

GENERAL INFORMATION - Continued 0001

CORROSION PREVENTION AND CONTROL (CPC)

1. Corrosion Prevention and Control (CPC) of Army materiel is a continuing concern. It is important that any corrosion problems with this item be reported so that the problem can be corrected and improvements can be made to prevent the problem in future items.
2. While corrosion is typically associated with rusting of metals, it can also include deterioration of other materials, such as rubber and plastic. Unusual cracking, softening, swelling, or breaking of these materials may be a corrosion problem.
3. If a corrosion problem is identified, it can be reported using SF 368, Product Quality Deficiency Report. Use of key words such as "corrosion," "rust," "deterioration," or "cracking" will ensure that the information is identified as a CPC problem.
4. The form should be submitted to the address specified in DA PAM 738-750, Functional Users Manual for the Army Maintenance Management System (TAMMS).

QUALITY OF MATERIAL

Parts and material used for replacement, repair, or modification shall meet the requirements of the equipment drawings and specified if standards are not provided in this NMWR.

ENGINEERING CHANGE PROPOSALS (ECP)

Engineering Change Proposals (ECPs) will be submitted using DD Form 1693 (Engineering Change Proposal [Short Form]). (Refer to MIL-STD-973, Configuration Management, for instructions.) Completed forms should be mailed directly to Commander, U.S. Army Tank-automotive and Armaments Command, ATTN: AMSTA-LC-CHLC, ATTN: Jody McInerney, Warren, MI 48397-5000

END OF TASK

GENERAL CLEANING INSTRUCTIONS 0002

THIS WORK PACKAGE (WP) COVERS:

General Cleaning

GENERAL CLEANING

a. General Instructions. Cleaning procedures will be the same for the majority of parts and components which make up the vehicle subassemblies. General cleaning procedures are detailed in "b" through "h".

b. The Importance of Cleaning. Great care and effort are required in all cleaning operations. The presence of dirt and foreign material is a constant threat to satisfactory vehicle operation and maintenance. The following will apply to all cleaning operations:

1. Hands must be kept free of any accumulation of grease which can collect dust and grit.

2. Clean all parts before inspection, after repair, and before assembly.

3. After cleaning, all parts must be covered or wrapped in plastic or paper to protect them from dust and/or dirt.

c. Disassembled Parts Cleaning. Place all disassembled parts in wire baskets for cleaning.

1. Dry and cover all cleaned parts.

2. Place on or in "racks" and hold for inspection or repair.

3. All parts subject to rusting must be lightly oiled and wrapped.

4. Keep all related parts and components together. Do not mix parts.

WARNING

Improper cleaning methods and use of unauthorized cleaning solutions will injure personnel and damage equipment. See TM 9-247 for correct information.

d. Castings.

1. Clean inner and outer surfaces of castings and all areas subject to grease and oil with cleaning solvents. Refer to TM 9-247.

2. Use a stiff brush to remove sludge and gum deposits.

GENERAL CLEANING INSTRUCTIONS - Continued 0002

WARNING

Compress air used for cleaning purposes will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc.).

3. Use compressed air to blow out all tapped capscrew holes and dry castings after cleaning.

e. Oil Passages. Particular attention must be given to all oil passages in castings and machined parts. Oil passages must be clean and free of any obstructions.

1. Clean passages with wire probes to break up any sludge or gum deposits.

2. Wash passages by flushing with solvents. See TM 9-247.

3. Dry passages with compressed air.

CAUTION

Do not allow solvents to come in contact with seals, cables, or flexible hoses. These cleaners cause leather, rubber, and synthetic materials to dry out, rot, and lose pliability making them unserviceable.

f. Nonmetallic Parts. Clean hoses and other nonmetallic parts with soap and water.

g. Bearings.

WARNING

Do not use compressed air to dry bearings. Spinning a dry bearing with compressed air may cause injury to personnel or damage to equipment.

1. Bearings require special cleaning. After removing surface oil and gum deposits wipe bearings dry with a lint-free cloth; do not use compressed air.

2. See TM 9-214 for information and care of bearings.

GENERAL CLEANING INSTRUCTIONS - Continued 0002

h. Electrical Components

1. Clean electrical components with clean cloth dampened with drycleaning solvent. Care must be taken not to damage protective insulation.

WARNING

Compress air used for cleaning purposes will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc.).

2. Use compressed air to dry electrical components.

END OF TASK

GENERAL INSPECTION INSTRUCTIONS 0003

THIS WORK PACKAGE (WP) COVERS:

General Inspection

INSPECTION

a. General Instructions. Procedures for inspections will be the same for many parts and components which make up the vehicle subassemblies. General procedures are detailed in "b" through "k". Dimensional standards for parts have been fixed at extremely close tolerances, so use specification tables. Use specified inspection equipment for inspection where cracks and other damage cannot be spotted visually. Exercise extreme care in all phases of inspection. Repair or replace all unserviceable components.

b. Castings.

1. Inspect all ferrous and nonferrous castings for cracks. See MIL-STD-6866, Inspection, Penetrant Methods. Particularly check areas around studs, pipe plugs, threaded inserts, and sharp corners. Replace cracked castings.

2. Inspect machined surfaces for nicks, burrs, and raised metal. Mark damaged areas for repair or replacement.

3. Inspect all pipe plugs, pipe plug openings, capscrews, and capscrew openings for damage and stripped threads. Replace if damaged or threads are stripped.

4. Check all gasket mating surfaces, flanges on housings, and supports for warpage with a straightedge or surface plate. Inspect mating flanges for discolorations which may indicate leakage. Replace if warped.

5. Check all castings for conformance to applicable repair standards. Refer to TM 9-214.

c. Bearings. Check all bearings for conformance to applicable repair standards.

d. Bushings and Bushing Type Bearings.

1. Check all bushings and bushing type bearings for secure fit, evidence of heating, wear, burrs, nicks, and out-of-round condition.

2. Check for dirt in lubrication holes or grooves. Holes and grooves must be clean and free from damage.

GENERAL INSPECTION INSTRUCTIONS - Continued 0003

e. Machined Parts.

1. Check machined parts for cracks, distortion, and damage.
2. Check all surfaces for nicks, burrs, and raised metal.

f. Studs, Bolts, Capscrews, and Nuts. Replace if bent, loose, stretched, or threads are damaged.

g. Gears.

NOTE

When gear teeth wear limits are not established, good judgement is required to determine if gear replacement is necessary.

1. Inspect all gears for cracks and missing teeth. Replace if cracked or teeth are missing.
2. Inspect gear teeth for wear, sharp fins, burrs, and galled or pitted surfaces.
3. Inspect splines for wear, burrs, and galled or pitted surfaces.
4. Check keyway slots for wear and/or damage.

h. Oil Seals. Oil seals are mandatory replacement items.

i. Casting Plugs. Inspect for leakage. Replace plugs when leakage is present.

j. Springs. Inspect for damaged, distorted, and collapsed coils.

k. Snaprings, Retaining Rings, and Washers. Many of these parts are mandatory replacement items. Inspect all others for obvious damage.

END OF TASK

GENERAL REPAIR INSTRUCTIONS 0004

THIS WORK PACKAGE (WP) COVERS:

General Repair Instructions

REPAIR

a. General Instructions. Repair of most parts and components is limited to general procedures outlined in applicable maintenance instructions and the following detailed procedures “b” through “h.”

CAUTION

Repaired items must be thoroughly cleaned to remove metal chips and abrasives to prevent them from entering working parts of vehicle components.

b. Castings.

1. All cracked castings will be replaced.

2. Only minor repairs to machined surfaces, flanges, and gasket mating surfaces are permitted. Remove minor nicks, burrs, and/or scratches by:

   a. Using fine mill file.

   b. Using abrasive cloth dipped in cleaning solvent.

   c. Lapping across a surface plate.

   d. Remachining of machined surfaces to repair damage, warpage, or uneven surfaces is not permitted. Replace castings.

3. Repair damaged threaded pipe plug and/or capscrew holes with a thread tap or repair oversize holes with threaded inserts.

c. Bearings. See TM 9-214.

d. Studs. Replace all bent and stretched studs. Repair minor thread damage with a thread restorer file. Replace studs having stripped or damaged threads as outlined below:

1. Remove, using a stud remover. Back studs out slowly to avoid heat buildup and seizure which can cause stud to break off.

2. If studs break off too short to use a stud remover, use extractor to remove.

GENERAL REPAIR INSTRUCTIONS - Continued 0004

3. Replacement studs have a special coating and must have a small amount of antiseize compound (appendix B, item 5) applied on threads before stud is installed. Install replacement stud slowly to prevent heat buildup and snapping off.

e. Gears.

1. Remove gears using pullers, as required.

2. Use the same methods described in paragraph b above, for castings to remove minor nicks, burrs, or scratches on gear teeth.

3. If keyways are worn or enlarged, replace gear.

f. Bushings and Bushing Type Bearings. When bushings and bushing type bearings seize to a shaft and spin in the bore, the associated part must also be inspected and replaced, as required.

g. Oil Seals.

1. Remove oil seals, being careful not to damage casting or adapter bore.

2. Always install new seal in bore using proper seal replacing tool.

h. Locking Threads. When using thread sealing compound:

1. Apply a liberal amount to both male and female threads on through-hole assemblies.

2. Apply a liberal amount into the bottom of a blind hole (non-through hole assemblies). Installing the fastener pneumatically forces the adhesive onto the threads.

3. Assemble parts shortly after applying thread sealing compound to allow adequate coating of threads.

END OF TASK

3L80 TRANSMISSION DISASSEMBLY INTO SUBASSEMBLIES 0005

THIS WORK PACKAGE (WP) COVERS:

a. Torque Converter; b. Holding Fixture; c. Oil Pan; d. Oil Filter; e Governor; f. Control Valve; g. Detent Selenoid; h. Front Servo; i. Rear Servo; j. Oil Pump; k. Forward Clutch and Turbine Shaft; l. Direct Clutch; m. Manual Linkage; n. Front Band; o. Intermediate Clutch; p. Gear Unit; q. Center Support; r. Rear Band

INITIAL SETUP:

Tools

General mechanic's tool kit: automotive (NSN 5180-00-177-7033)

Special Tools

Transmission holding fixture	(NSN 5120-01-198-7583); P/N J8763-02
Transmission holding fixture base	(NSN 5120-01-144-4484); P/N J3289-20
Two slide hammer adapters	(NSN 5120-01-130-8865); P/N J6471-2
Gear unit holding tool	(NSN 4910-01-178-8865); P/N J21795-02

General Safety Instructions

Torque converter must be supported during removal

a. Torque Converter

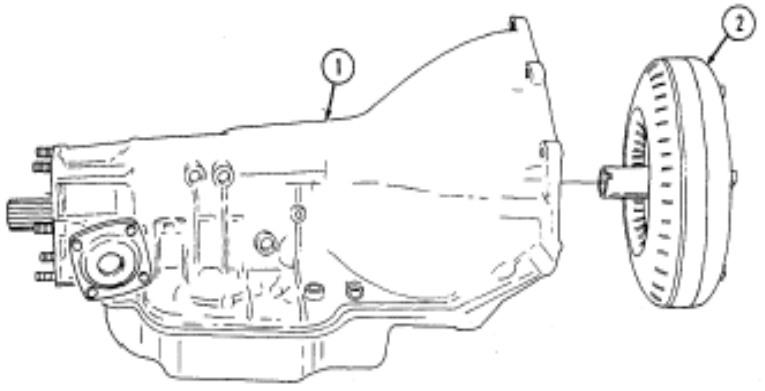
WARNING

Torque converter must be supported during removal and installation. Failure to do this may cause injury to personnel or damage to equipment.

NOTE

Ensure torque converter turns freely. Record any abnormal looseness or noise.

Remove torque converter (2) from transmission (1).



3L80 TRANSMISSION DISASSEMBLY INTO SUBASSEMBLIES - Continued 0005

b. Holding Fixture (Optional at Disassembly)

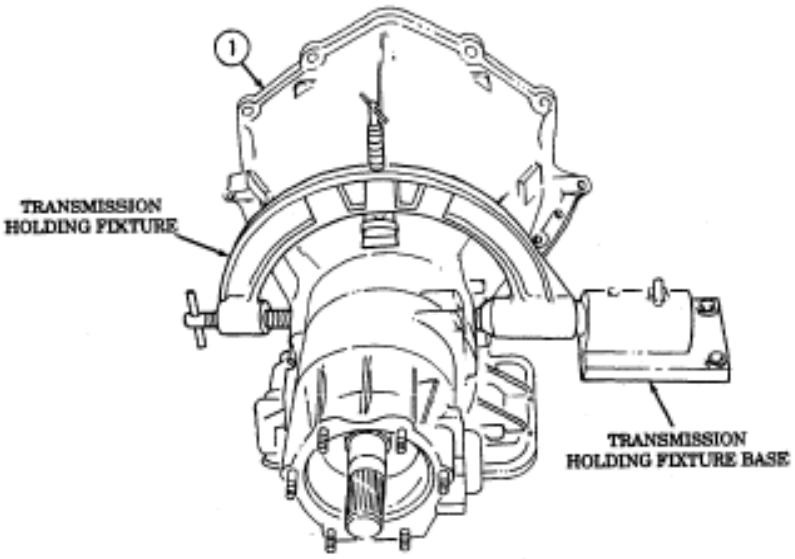
CAUTION

Do not overtighten screws. This will bind center support.

1. Install transmission holding fixture into locating holes on side of transmission (1).

2. Install transmission holding fixture and transmission (1) into transmission holding fixture base.

3. Position front of transmission (1) up and allow to drain.



3L80 TRANSMISSION DISASSEMBLY INTO SUBASSEMBLIES - Continued 0005

c. Oil Pan

1. Position transmission case (6) so oil pan (2) faces upward.

2. Remove thirteen capscrews (1), oil pan (2), and oil pan gasket (3) from case (6). Discard gasket (3).

3. Clean mating surfaces of case (6) and oil pan (2).

d. Oil Filter

1. Remove shoulder bolt (13), oil filter (4), intake pipe (12), and spacer (5) from case (6). Discard filter (4).

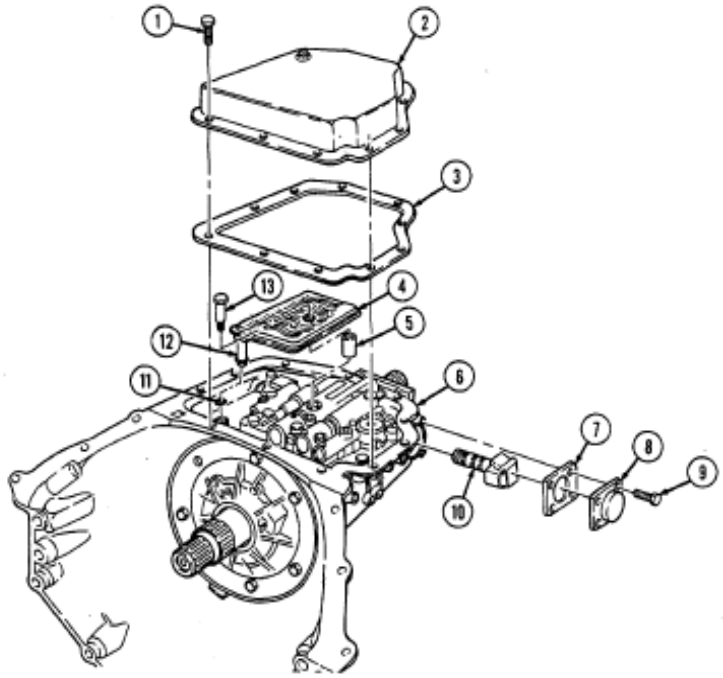
2. Remove intake pipe O-ring seal (11) from case (6). Discard O-ring seal (11).

e. Governor

1. Remove four capscrews (9), governor cover (8), and gasket (7) from case (6). Discard gasket (7).

2. Remove governor (10) from case (6).

3. Clean mating surfaces of governor cover (8) and case (6).



3L80 TRANSMISSION DISASSEMBLY INTO SUBASSEMBLIES - Continued 0005

f. Control Valve

1. Remove eight capscrews (19), detent roller and spring (18), and three capscrews (20) from control valve (21) and case (6).

2. Remove control valve (21), gasket (22), and governor pipes (17) from case (6).

3. Remove governor screen (16) from governor feed pipe (17) or feed pipe hole (28).

4. Remove modulator valve (25) from case (6).

g. Detent Solenoid

1. Disconnect detent solenoid wire (29) from electrical connector (27).

2. Remove two capscrews (15) and detent solenoid (14) from case (6).

3. Remove control valve spacer plate (23) and gasket (24) from case (6). Discard gasket (24).

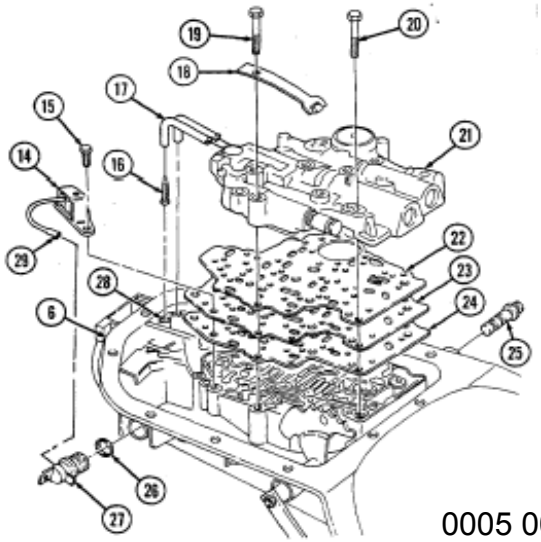
4. If necessary, compress three tabs on electrical connector (27) and remove electrical connector (27) and O-ring seal (26) from case (6). Discard O-ring seal (26).

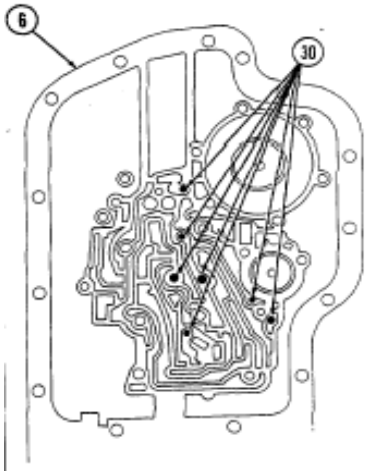
NOTE

- Do not scratch marks on any machined surface of transmission case.
- There may only be six check balls.

5. Note location of seven check balls (30) in passages in case (6) for assembly.

6. Remove seven check balls (30) from case (6).





3L80 TRANSMISSION DISASSEMBLY INTO SUBASSEMBLIES - Continued 0005

h. Front Servo

Remove front servo pin (4), piston (2), retaining ring (3), spring retainer (5), and spring (6) from case (7).

i. Rear Servo

1. Remove six capscrews (1), servo cover (12), and gasket (11) from case (7). Discard gasket (11).

2. Remove rear servo piston (10), accumulator piston (9), and spring (8) from case (7).

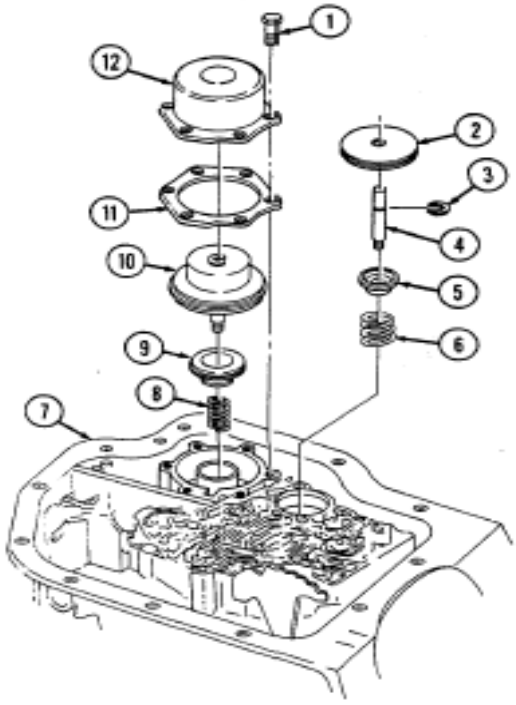
j. Oil Pump

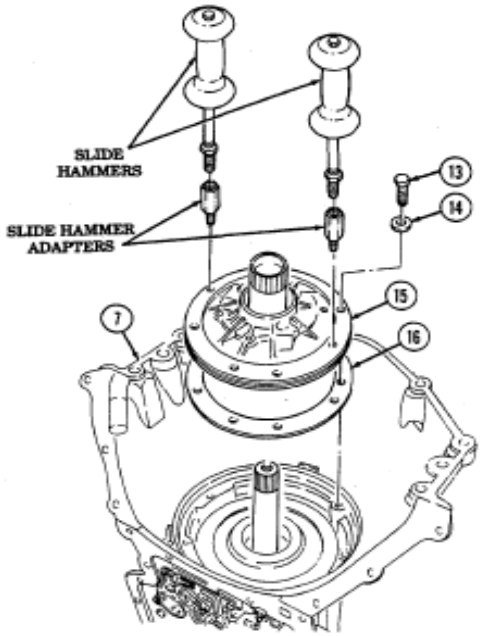
1. Position transmission case (7) so oil pump (15) faces up.

2. Remove six capscrews (13), seal washers (14), and oil pump (15) from case (7). Discard seal washers (14).

3. Install slide hammer adapters into threaded holes in oil pump (15).

4. Using slide hammer and adapters, remove oil pump (15) and gasket (16) from case (7). Discard gasket (16).





3L80 TRANSMISSION DISASSEMBLY INTO SUBASSEMBLIES - Continued 0005

k. Forward Clutch and Turbine Shaft

1. Remove forward clutch and turbine shaft (17) from case (7).

2. Remove forward clutch hub thrust washer (23) from forward clutch and turbine shaft (17) and tag for assembly.

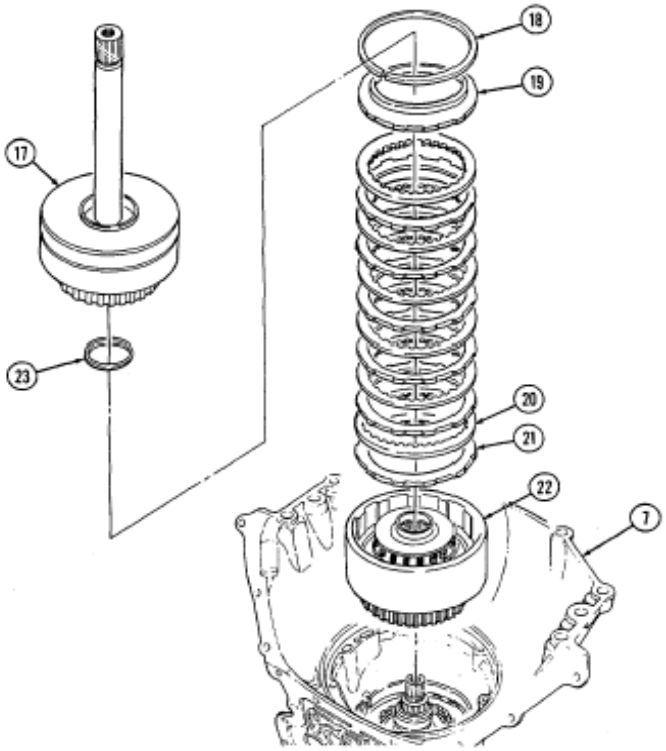
l. Direct Clutch

1. Remove snapring (18) securing direct clutch backing plate (19) to direct clutch housing (22).

2. Remove direct clutch housing plate (19), six composition clutch plates (20), and six steel clutch plates (21) from direct clutch housing (22).

3. Remove direct clutch housing (22) from case (7).

4. Install clutch plates (21) and (20) and backing plate (19) in direct clutch housing (22) with snap ring (18).



3L80 TRANSMISSION DISASSEMBLY INTO SUBASSEMBLIES - Continued 0005

m. Manual Linkage

1. Remove nut (6) securing shift lever (5) to manual shaft (4) and remove shift lever (5).

2. Loosen jam nut (8) from manual shaft (4).

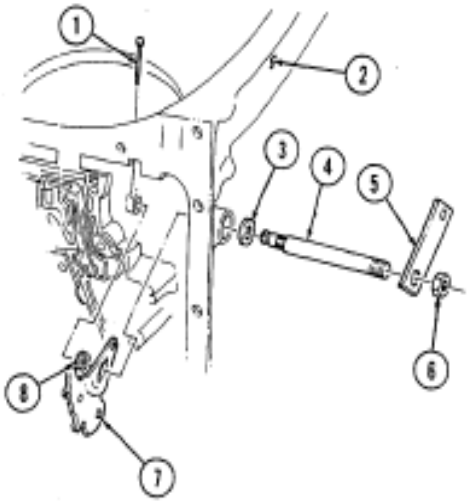
3. Remove manual shaft retaining pin (1) from case (2).

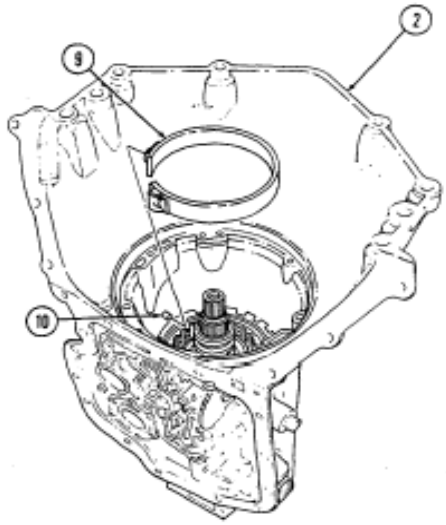
4. Remove manual shaft (4), jam nut (8), and detent lever (7) from case (2).

5. Remove manual shaft seal (3) from case (2). Discard seal (3).

n. Front Band

Lift front band (9) away from anchor pin (10) and remove band (9) from case (2).





3L80 TRANSMISSION DISASSEMBLY INTO SUBASSEMBLIES - Continued 0005

o. Intermediate Clutch

1. Remove snapring (11) from intermediate clutch backing plate (12) and case (2).

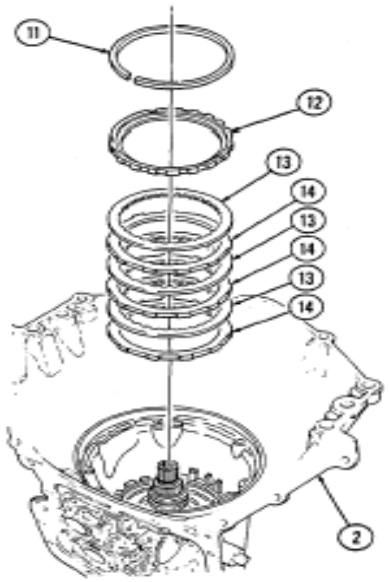
2. Remove backing plate (12), three-composition clutch plates (13), and three steel clutch plates (14) from case (2). Discard composition clutch plates (13).

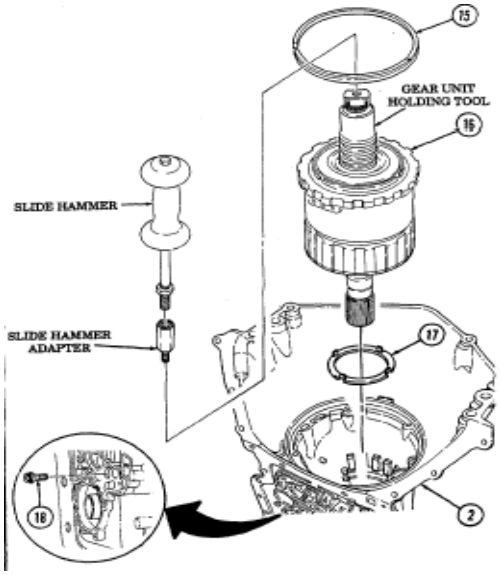
p. Gear Unit

1. Using 3/8 in. 12-point socket, remove center support-to-case aligning bolt (18) from case (2).

2. Remove center support-to-case snap ring (15) from case (2).

3. Using gear unit holding tool, slide hammer adapter, and slide hammer, remove center support and gear unit assembly (16) and rear case thrust washer (17) from case (2). Install thrust washer (17) on center support and gear unit assembly (16).





3L80 TRANSMISSION DISASSEMBLY INTO SUBASSEMBLIES - Continued 0005

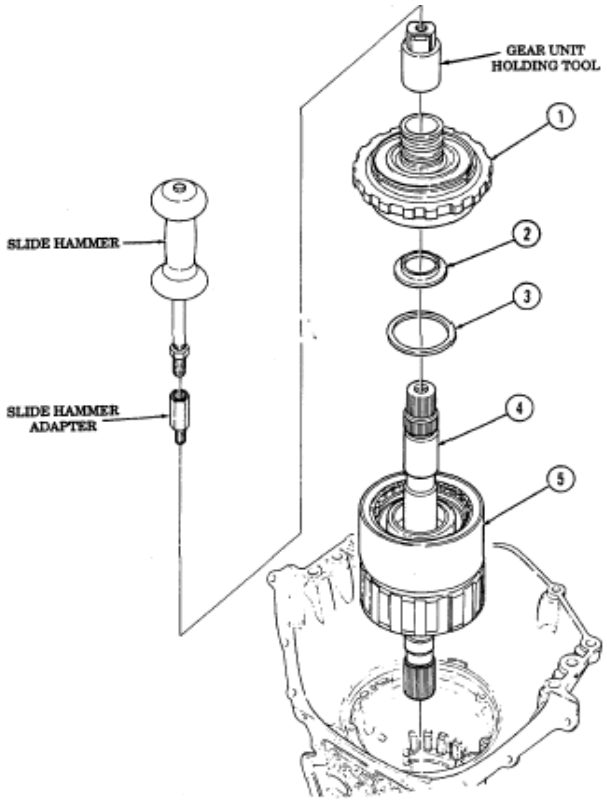
q. Center Support

1. Remove slide hammer, slide hammer adapter, and gear unit holding tool from gear unit (5).

2. Remove center support (1) from gear unit (5).

3. Remove center support thrust washer (3) from center support (1) and tag for assembly.

4. Remove outer sun gear thrust bearing race (2) from center support (1) and place over sun gear shaft (4).



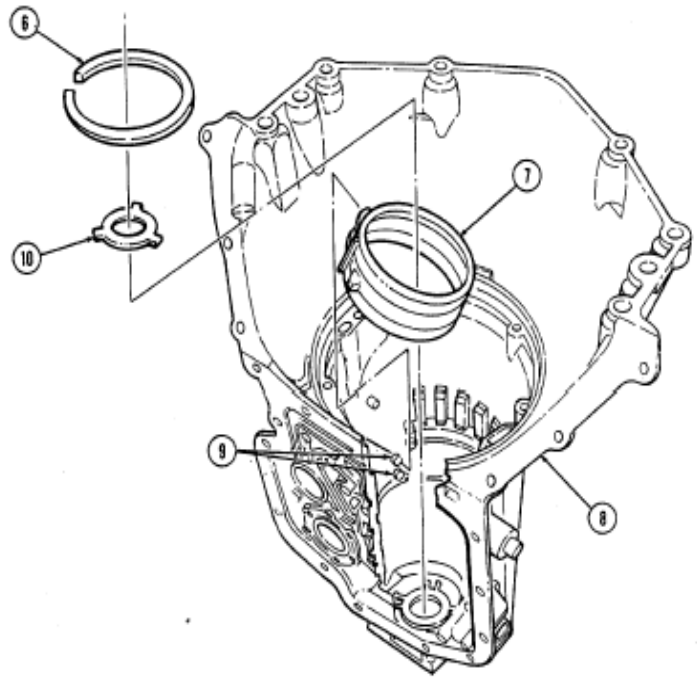
3L80 TRANSMISSION DISASSEMBLY INTO SUBASSEMBLIES - Continued 0005

r. Rear Band

1. Remove rear selective washer (10) from case (8).

2. Remove center support-to-case spacer (6) from case (8).

3. Lift rear band (7) away from anchor pins (9) and remove rear band (7) from case (8).



END OF TASK

3L80 TRANSMISSION CASE REPAIR 0006

THIS WORK PACKAGE (WP) COVERS:

Cleaning; Inspection

INITIAL SETUP:

Tools

General mechanic's tool kit: automotive (NSN 5180-00-177-7033)

Equipment Condition

Transmission disassembled into subassemblies

Special Tools:

Bushing service set	(NSN 5180-01-195-9777); P/N J 21465-01
Driver Handle	(NSN 5120-00-677-2259); P/N J 8092

Materials/Parts:

Bushing	(NSN 3120-01-166-3677); P/N 8623941
Center support assembly	(NSN 5310-00-282-0512); MS20365-1032C

Equipment Condition:

Transmission disassembled into subassemblies

General Safety Instructions:

- Compressed air for cleaning purposes will not exceed 30 psi (207 kPa).
- Protective clothing must be used when steam cleaning.

NOTE

- Work area should be well-ventilated, clean, and free from blowing dirt and dust.
- For general cleaning instructions, refer to **WP 0002**.

3L80 TRANSMISSION CASE REPAIR - Continued 0006

CLEANING

1. Remove transmission case (3) from transmission holding fixture.

WARNING

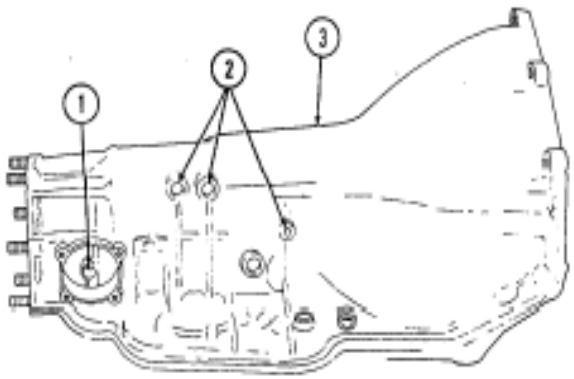
When steam cleaning, protective clothing must be used. Failure to do this may cause serious injury.

2. Thoroughly steam clean transmission case (3).

WARNING

Compressed air used for cleaning purposes will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc.).

3. Blow all dirt and cleaning solution from transmission case (3) with compressed air.



INSPECTION

NOTE

For general inspection instructions, refer to **WP 0003**.

1. Inspect all surfaces and general overall condition of transmission case (3).

2. Inspect front and rear band anchor pins (2) for looseness. Replace transmission case (3) if anchor pins (2) are loose or missing

3L80 TRANSMISSION CASE REPAIR - Continued 0006

3. Inspect intermediate clutch plate lugs (5) for damage. Replace transmission case (3) if lugs (5) are damaged.

4. Inspect governor bore (1) for scoring, pitting, or damage. Replace transmission case (3) if scored, pitted, or damaged.

NOTE

If transmission was manufactured before March 1, 1990 and a new transmission case is to be used, install a new center support assembly.

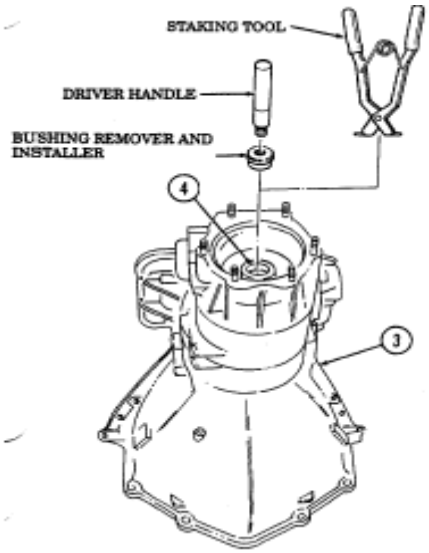
5. Inspect all threaded holes in transmission case (3) for damage. Repair any damaged threaded hole with thread repair inserts. If unable to repair threaded hole, replace transmission case.

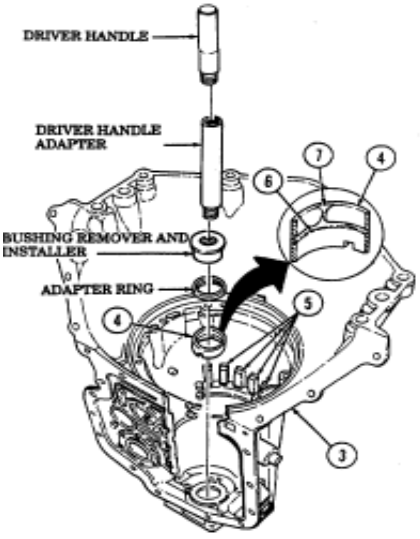
6. Inspect rear case bushing (4) for damage. If damaged, perform steps 7 through 9.

7. Working from rear of transmission case (3), use bushing remover and installer J21465-8 and driver handle to remove bushing (4) from transmission case (3). Discard bushing (4).

8. Working from front of transmission case (3), use driver handle, driver handle adapter J21465-13, bushing remover and installer J21465-8, and adapter ring J21465-9 to install bushing (4). Place bushing (4) on remover and installer with lube passage (7) on bushing (4) facing adapter ring. Install bushing (4) on transmission case (3) until adapter ring bottoms.

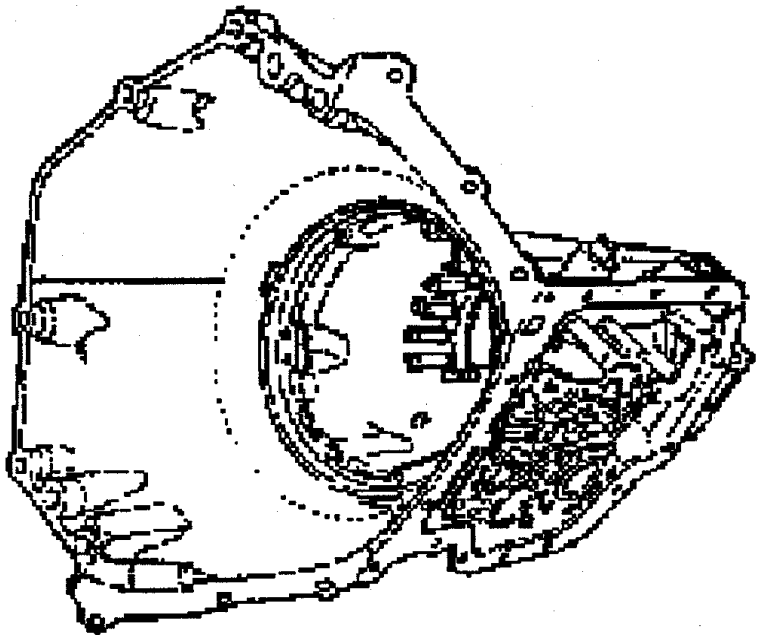
9. Working from rear of transmission case (3), use staking tool to stake bushing (4). Stake marks must be in bushing groove (6).





3L80 TRANSMISSION CASE REPAIR - Continued 0006

REPAIR OF CRACKS



Welding of the transmission case is limited to the bell housing area up to 3 inches away from the transmission oil pump face.

END OF TASK

3L80 OIL PUMP REPAIR 0007

THIS WORK PACKAGE (WP) COVERS:

Disassembly; Cleaning; Inspection

INITIAL SETUP:

Tools

General mechanic's tool kit: automotive (NSN 5180-00-177-7033)

Special Tools

Slide hammer adapter	(NSN 5120-01-130-8865); P/N J 6471-2
Bushing service set	(NSN 5180-01-195-9777); P/N J21465-01
Driver handle	(NSN 5120-00-677-2259); P/N J 8092
Oil pump seal installer	(NSN 5120-01-176-1845); P/N J 21359A

Materials/Parts

Two oil ring seals	(NSN 5330-01-165-4333); P/N 8626356
O-ring seal	(NSN 5330-00-001-1996); P/N 23016599
Oil seal	(NSN 5330-01-025-4212); P/N 8626916
Sealing compound	(NSN 8030-00-009-5023)
Transmission fluid	(NSN 9150-00-698-2382) – 1 Quart Can (NSN 9150-01-144-9968) – 55 Gallon Can

Equipment Condition:

Transmission disassembled into subassemblies

NOTE

Work area should be well ventilated, clean, and free from blowing dirt and dust.

3L80 OIL PUMP REPAIR - Continued 0007

DISASSEMBLY

CAUTION

Pressure regulator is spring loaded.

1. Remove snapring (11), boost valve bushing (12), boost valve (13), pressure regulator spring (14), regulator valve (17), spring retainer (15), and spacer(s) (16) from pump cover (4).

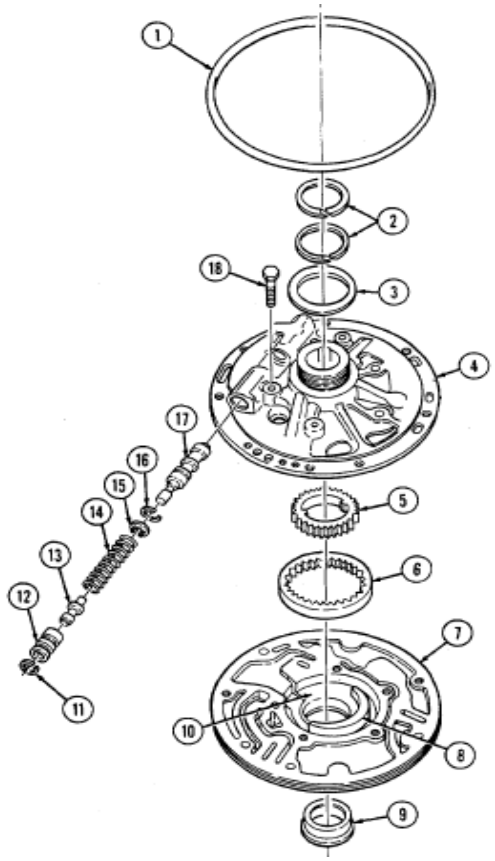
2. Remove oil pump O-ring seal (1) from pump cover (4). Discard O-ring seal (1).

3. Remove two oil ring seals (2) and selective washer (3) from pump cover (4). Discard oil seal rings (2).

4. Remove five capscrews (18) and pump cover (4) from pump body (7).

5. Mark drive gear (5) and driven gear (6) for assembly.

6. Remove drive gear (5), driven gear (6), and oil seal (9) from pump body (7). Discard oil seal (9).



3L80 OIL PUMP REPAIR - Continued 0007

CLEANING

Refer to **Cleaning, WP 0002** for general cleaning instructions.

INSPECTION

Refer to **Inspection, WP 0003** for general inspection instructions.

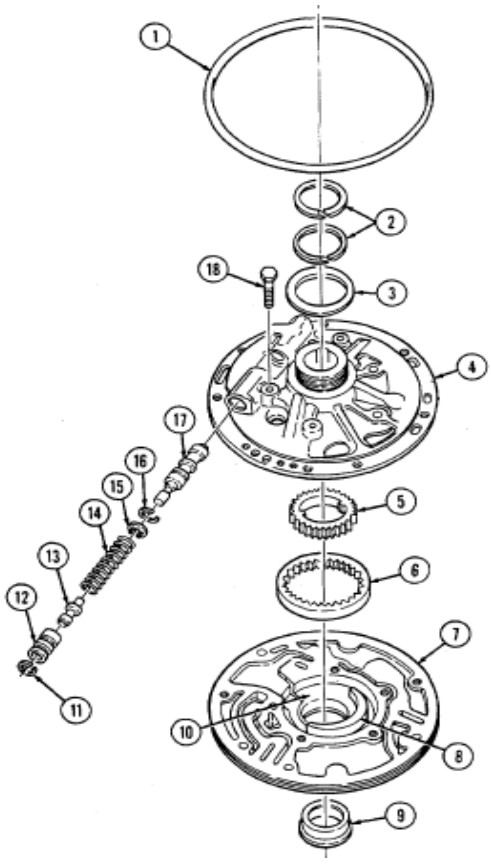
1. Inspect gear pockets (10), crescent (8), drive gear (5), driven gear (6), and pump body (7) for scoring, galling, or damage. Replace oil pump if any parts are scored, galled, or damaged.

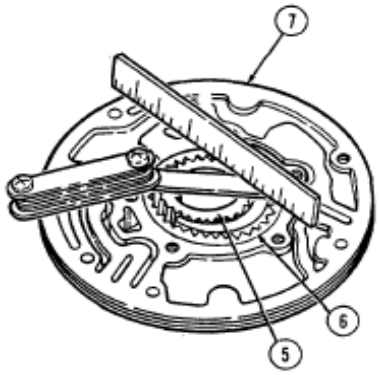
2. Place drive gear (5) and driven gear (6) in pump body (7).

3. Check pump body (7) to drive gear (5) face and driven gear (6) face clearance using a straight edged feeler gauge. Clearance should be within 0.0008-0.0035 inch (0.02-0.09 mm). If clearance does not meet specifications, replace oil pump.

4. Inspect snapring (11), boost valve bushing (12), and boost valve (13) for damage. Replace all items if one item is damaged.

5. Inspect pressure regulator spring (14), spring retainer (15), spacer(s) (16), and regulator valve (17) for damage. Replace any damaged items.

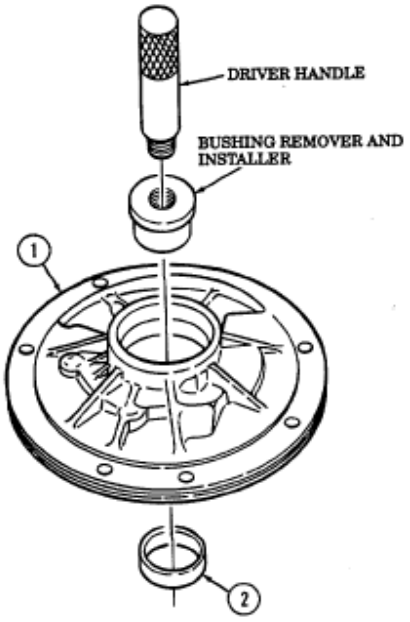


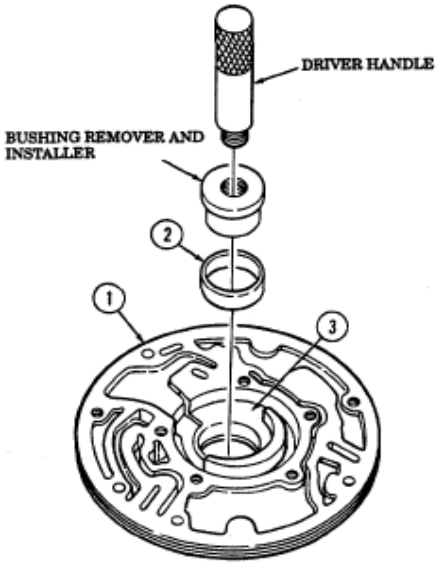


3L80 OIL PUMP REPAIR - Continued 0007

6. Using driver handle and bushing remover and installer J21465-17, remove bushing (2) from pump body (1). Discard bushing (2).

7. Using driver handle and bushing remover and installer J21465-17, install bushing (2) in pump body (1) until bushing (2) is 0.010 in. (0.25 mm) below gear pocket face (3).





3L80 OIL PUMP REPAIR - Continued 0007

8. Inspect pump cover (7) for galling or scoring. Replace oil pump if cover (7) is damaged.

9. Inspect stator shaft splines (5) for damage. Replace oil pump if splines (5) are damaged.

10. Inspect oil ring grooves (8) for damage. Replace oil pump if grooves (8) are damaged.

11. Inspect front and rear stator shaft bushings (4) for damage. If damaged, perform steps 13 through 15. If not, go to **ASSEMBLY**.

NOTE

Replacement procedures for front or rear stator shaft bushings are basically the same. Steps 13 through 15 cover the front stator shaft bushing.

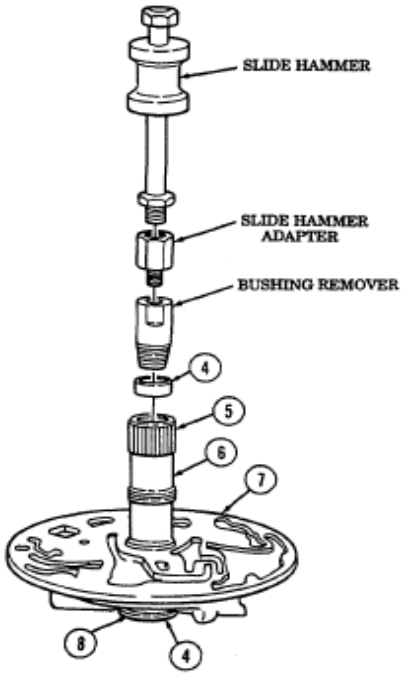
12. Mount pump cover (7) in soft-jawed vise.

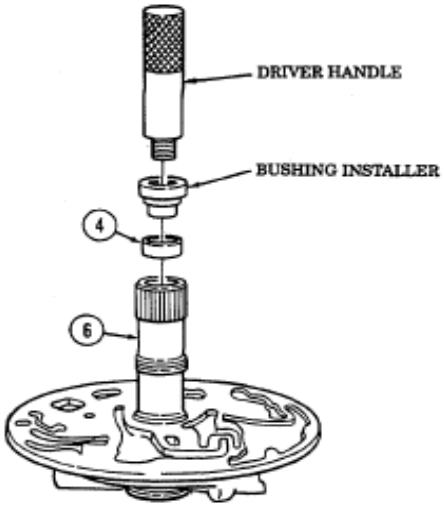
13. Using bushing remover J21465-15, slide hammer adapter, and slide hammer, remove stator shaft bushing (4) from stator shaft (6). Discard bushing (4).

NOTE

Use bushing installer J21465-2 if replacing rear stator shaft bushing.

14. Using driver handle and bushing installer J21465-3, install bushing (4) in stator shaft (6).





3L80 OIL PUMP REPAIR - Continued 0007

ASSEMBLY

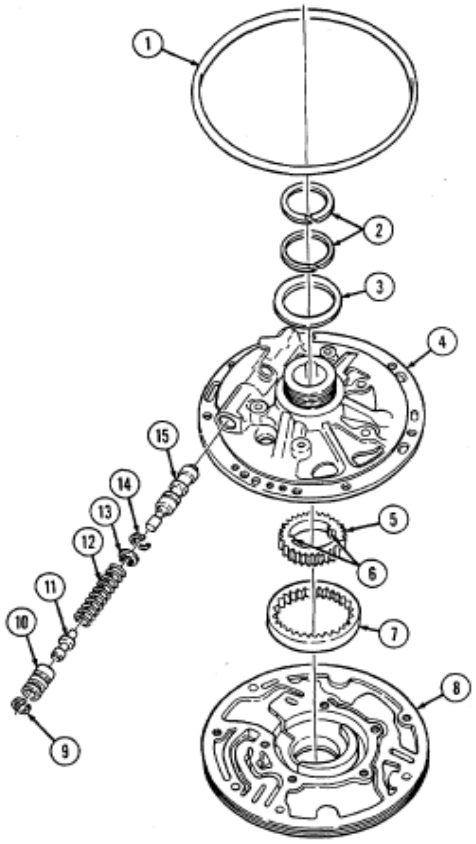
CAUTION

- Cleanliness is essential in assembly operations. Dirt and dust, even in minute quantities are abrasive. Parts must be cleaned as specified and kept clean. Wrap or cover parts when assembly procedures are not immediately completed.

- All transmission parts must be lubricated with clean transmission fluid before assembly. Foreign material will cause transmission damage.

1. Install drive gear (5) and driven gear (7) in pump body (8) with reference marks and tangs (6) on drive gear (5) aligned face up.

2. Install pump cover (4) on pump body (8).



3L80 OIL PUMP REPAIR - Continued 0007

NOTE

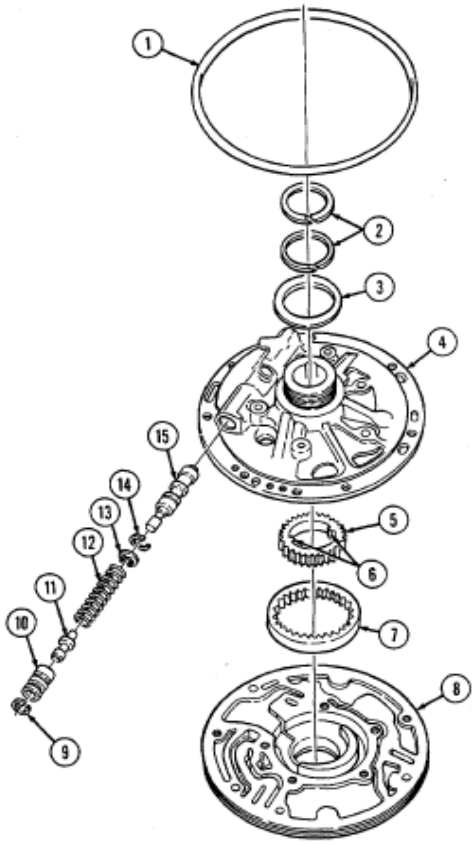
See Table for proper location of capscrews.

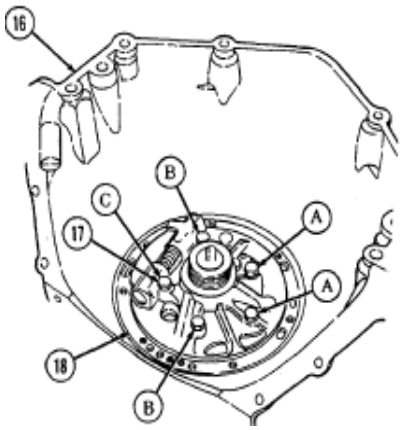
3. Align pump cover (4) and pump body (8) and install five capscrews (17).

Table for Capscrew location

Capscrew A	5/16 X 18 X 1
Capscrew B	5/16 X 18 X 1-1/2
Capscrew C	5/16 X 18 X 1-3/4

4. Install oil pump (18) into transmission case (16) and tighten five capscrews (17) to 18 lb-ft (24 N•m).





3L80 OIL PUMP REPAIR - Continued 0007

5. Remove oil pump (18) from transmission case (16).

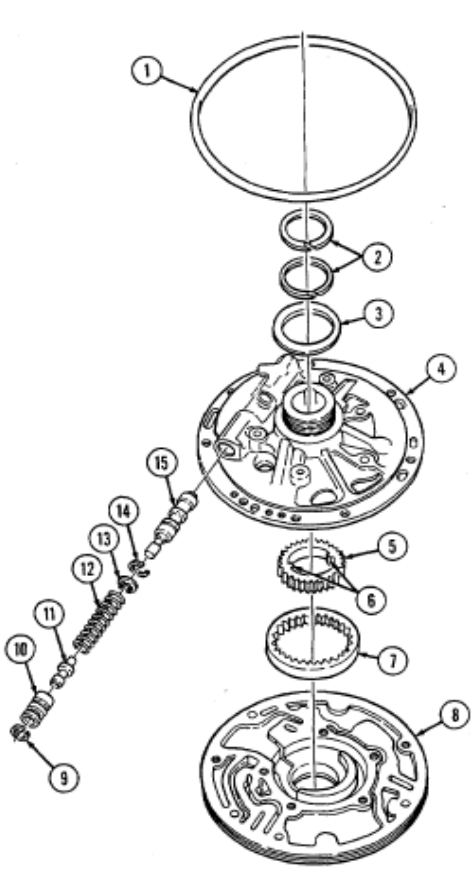
6. Install regulator valve (15), spacer(s) (14), spring retainer (13), spring (12), boost valve (11), boost valve bushing (10), and snapring (9) in pump cover (4).

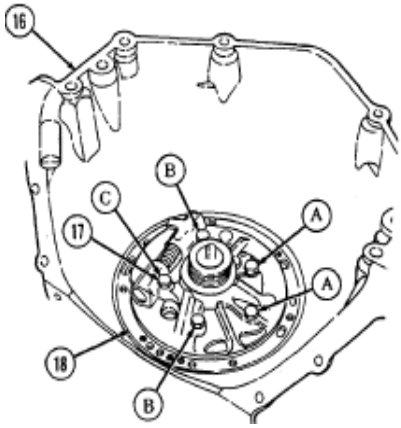
7. Install selective washer (3) and two oil ring seals (2) on pump cover (4). Ensure lap joints on oil ring seals (2) are properly joined.

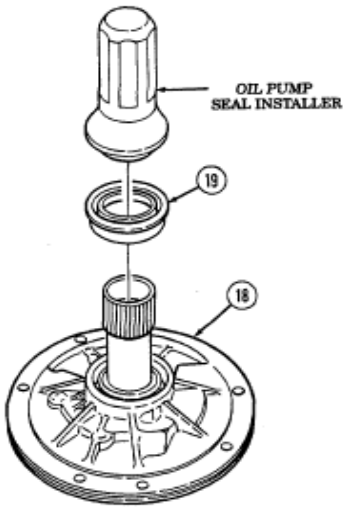
8. Install O-ring seal (1) on pump cover (4).

9. Apply sealing compound to outside diameter of oil seal (19).

10. Using oil pump seal installer, install oil seal (19) in oil pump (18).







END OF TASK

3L80 FORWARD CLUTCH AND TURBINE SHAFT REPAIR 0008

THIS WORK PACKAGE (WP) COVERS:

Disassembly; Cleaning; Inspection; Assembly

INITIAL SETUP:

Tools

General mechanic's tool kit: automotive	(NSN 5180-00-177-7033)

Special Tools

Clutch spring compressor	(NSN 5120-01-210-8793); P/N J 4670-01
Clutch spring compressor adapter	(4910-01-210-8793); P/N J21664

Materials/Parts

Five composition clutch plates	(NSN 5360-01-150-6091); P/N 8624101
Inner piston seal	(NSN 5330-01-146-6053); P/N 23015880
Outer piston seal	(NSN 5330-00 001-4904); P/N 8623101
Petrolatum	(NSN 9150-00-250-0926) 1 ¾ Pound Can
	(NSN 9150-00-250-0933) 7 ½ Pound Can
Transmission fluid	(NSN 9150-00-698-2382) 1Quart Can
	(NSN 9150-00-657-4959) 5 Gallon Can

Equipment Condition

Transmission disassembled into subassemblies

General Safety Instructions

Air pressure must not exceed 50 psi (345 kPa) when air checking clutch piston.

NOTE

Work area should be well ventilated, clean, and free from blowing dirt and dust.

3L80 FORWARD CLUTCH AND TURBINE SHAFT REPAIR - Continued 0008

DISASSEMBLY

1. Remove snapring (1), direct clutch hub (2), forward clutch hub (3), thrust washer (4), five composition clutch plates (7), and steel clutch plates (5) from forward clutch housing (6). Discard composition clutch plates (7).

2. Place clutch housing (6) in press. Using clutch spring compressor and clutch spring compressor adapter, compress spring retainer (9) and remove snapring (8) and spring retainer (9) from clutch housing (6).

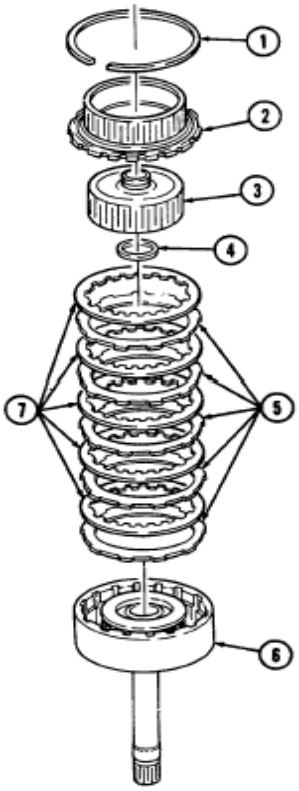
NOTE

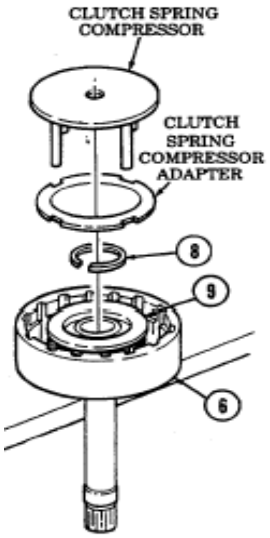
Keep forward clutch release springs separate from direct clutch release springs

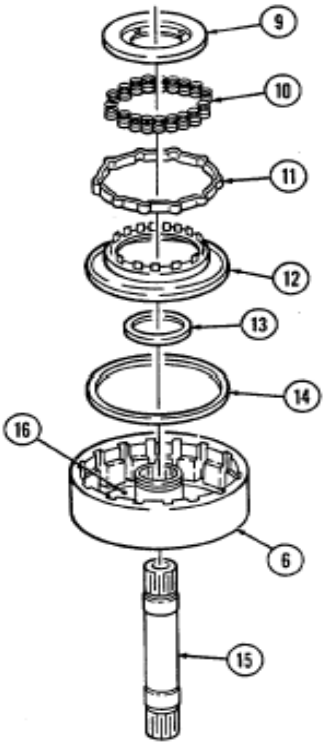
3. Remove spring retainer (9), sixteen release springs (10), and clutch piston (12) from clutch housing (6).

4. Remove inner piston seal (13) and outer piston seal (14) from clutch piston (6). Discard seals (13).

5. Remove clutch piston apply ring (11) from clutch piston (12).







3L80 FORWARD CLUTCH AND TURBINE SHAFT REPAIR - Continued 0008

CLEANING

Refer to **Cleaning WP 0002** for general cleaning instructions.

INSPECTION

NOTE
For general inspection instructions, refer to **WP 0003**.

1. Inspect five steel clutch plates (5) for signs of burning, scoring, or cracks. Replace any that are burnt, scored, or cracked.

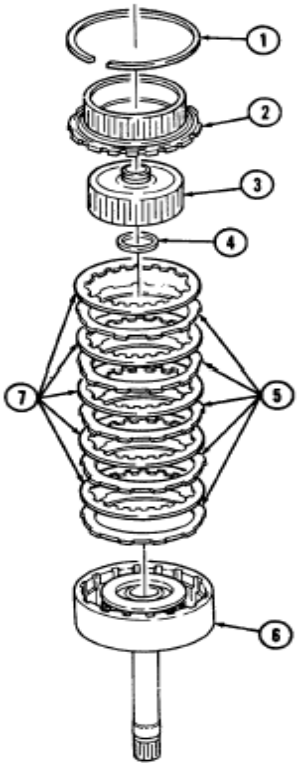
2. Inspect thrust washer (4), spring retainer (9), and snapring (8) for distortion or damage. Replace any if distorted or damaged.

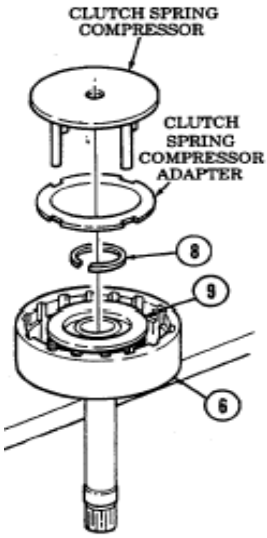
3. Inspect forward clutch hub (3) and direct clutch hub (2) for damage. Replace either if damaged.

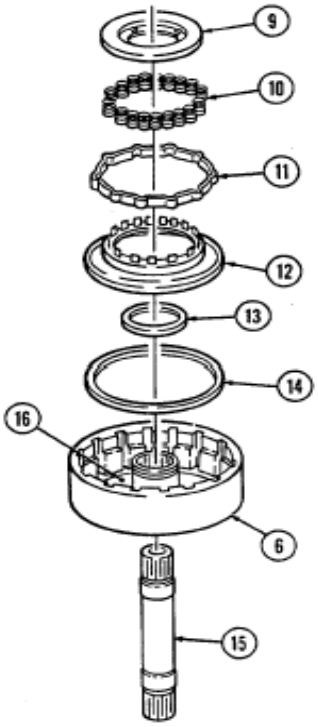
4. Inspect clutch piston (12) for distortion or damage. Replace if distorted or damaged.

5. Inspect clutch release springs (10) for collapsed coils or distortion. Replace all release springs (10) if any are damaged.

6. Inspect clutch housing (6) and turbine shaft (15) for damage. If either are damaged, perform steps 7 through 10. If not, go to d. assembly.







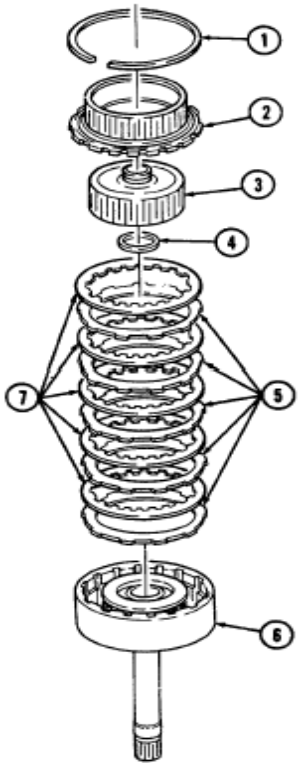
3L80 FORWARD CLUTCH AND TURBINE SHAFT REPAIR - Continued 0008

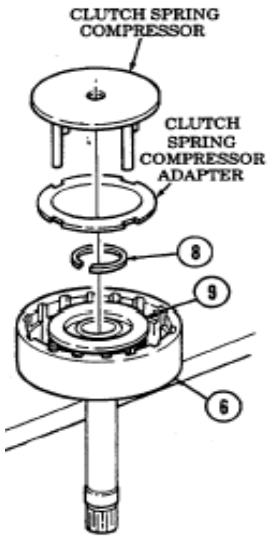
7. Using press, remove turbine shaft (15) from clutch housing (6).

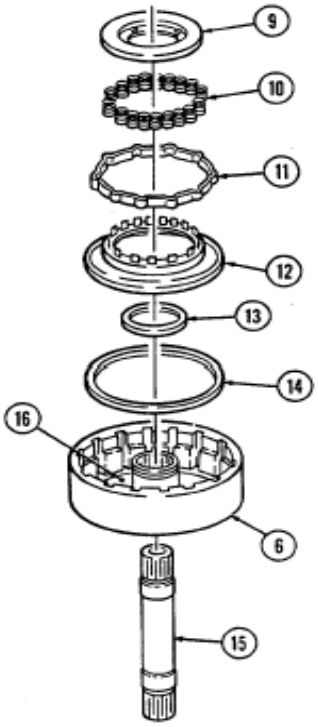
8. Check for freeness of check ball (16) in clutch housing (6), and that all oil passages are open. Replace forward clutch assembly if check ball (16) is not free or if oil passages are blocked.

9. Inspect turbine shaft (15) for blocked oil passages. Replace turbine shaft (15) if oil passages are blocked.

10. Using press, install turbine shaft (15) in clutch housing (6).







3L80 FORWARD CLUTCH AND TURBINE SHAFT REPAIR - Continued 0008

ASSEMBLY

CAUTION

All transmission parts must be lubricated with clean transmission fluid before assembly. Foreign material will cause transmission damage.

1. Install clutch piston apply ring (3) in clutch piston (5).

2. Install inner piston seal (6) and outer piston seal (7) on clutch piston (5). Ensure lips on piston seals (6) and (7) face away from spring guides (4).

NOTE

It may be necessary to use 0.015 in. (0.381 mm) feeler gauge to start inner and outer piston seals into clutch housing.

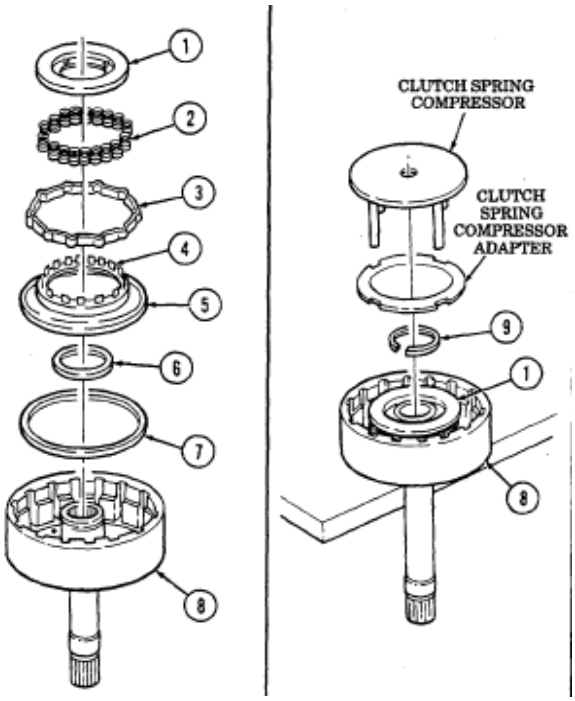
3. Install clutch piston (5) in clutch housing (8).

4. Install sixteen release springs (2) and spring retainer (1) on clutch piston (5).

5. Place clutch housing (8) in press.

6. Using clutch spring compressor and clutch spring compressor adapter, compress spring retainer (1).

7. Install snapring (9) securing spring retainer (1) to clutch housing (8).



3L80 FORWARD CLUTCH AND TURBINE SHAFT REPAIR - Continued 0008

8. Install forward clutch hub thrust washer (13) on forward clutch hub (12) and retain with petrolatum.

9. Install clutch hub (12) in clutch housing (8). .

10. Install five steel clutch plates (14) and five composition clutch plates (15) in clutch housing (8). Start with steel clutch plate (14) then alternate composition clutch plates (15) and steel clutch plates (14).

11. Install direct clutch hub (11) in clutch housing (8) with snapring (10).

12. Install forward clutch housing (8) on oil pump (17).

WARNING

Air pressure must not exceed 50 psi (345 kPa) when air checking clutch piston, or injury to personnel or damage to equipment may result.

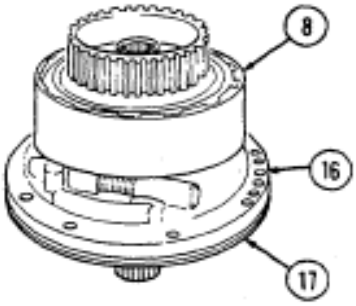
NOTE

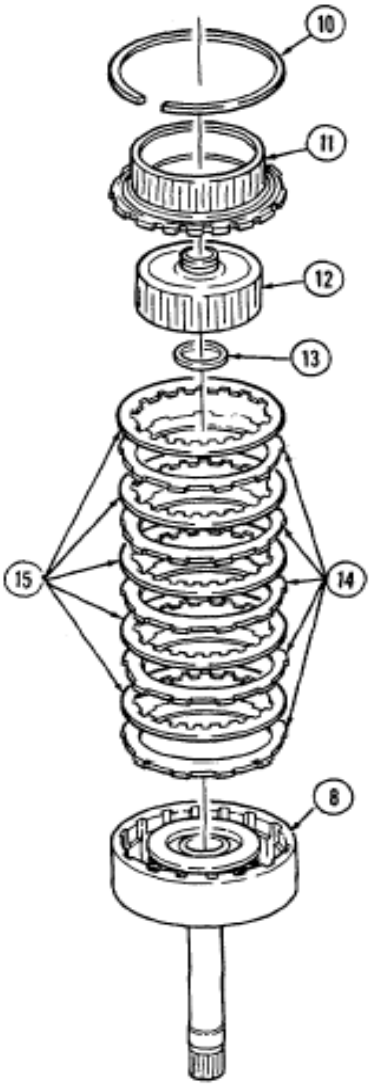
Direct clutch hub must move up and down freely when air pressure is applied.

13. Apply air pressure to forward clutch oil passage (16) to check operation of clutch piston.

3L80 FORWARD CLUTCH AND TURBINE SHAFT REPAIR - Continued

0008





END OF TASK

3L80 DIRECT CLUTCH AND INTERMEDIATE SPRAG REPAIR 0009

THIS WORK PACKAGE (WP) COVERS:

Disassembly; Cleaning; Inspection; Assembly

INITIAL SETUP:

Tools

General mechanic's tool kit: automotive	(NSN 5180-00-177-7033)

Special Tools

Clutch spring compressor	(NSN 5120-01-210-8793); P/N J 4670-01
Clutch spring compressor adapter	(NSN 4910-01-210-8793); P/N J 21664

Materials/Parts

Six composition clutch plates	(NSN 5360-01-150-6091); P/N 8624101
Inner piston seal	(NSN 5330-01-146-6053); P/N 23015880
Outer piston seal	(NSN 5330-00-001-4904); P/N 8623101
Center piston seal	(NSN 2840-00-001-4903); P/N 8623102
Transmission fluid	(NSN 9150-00-698-2382) 1Quart Can (NSN 9150-00-657-4959) 5 Gallon Can

Equipment Condition

Transmission disassembled into subassemblies.

General Safety Instructions

Air pressure must not exceed 50 psi (345 kPa) when air checking clutch piston.

NOTE

Work area should be well ventilated, clean, and free from blowing dirt and dust.

3L80 DIRECT CLUTCH AND INTERMEDIATE SPRAG REPAIR - Continued 0009

DISASSEMBLY

1. Remove snapring (1), sprag retainer (2), outer race (3), bushing (4), sprag (5), and bushing (4) from direct clutch housing (6).

2. Remove snapring (7), backing plate (8), six composition clutch plates (10), and steel clutch plates (9) from clutch housing (6). Discard composition clutch plates (10).

3. Using press, clutch spring compressor, and clutch spring compressor adapter, compress spring retainer (12).

4. Remove snapring (11) securing spring retainer (12) to clutch housing (6).

NOTE

Keep direct clutch release springs separate from forward clutch release springs.

5. Remove spring retainer (12), fourteen release springs (13), and clutch piston (15) from clutch housing (6).

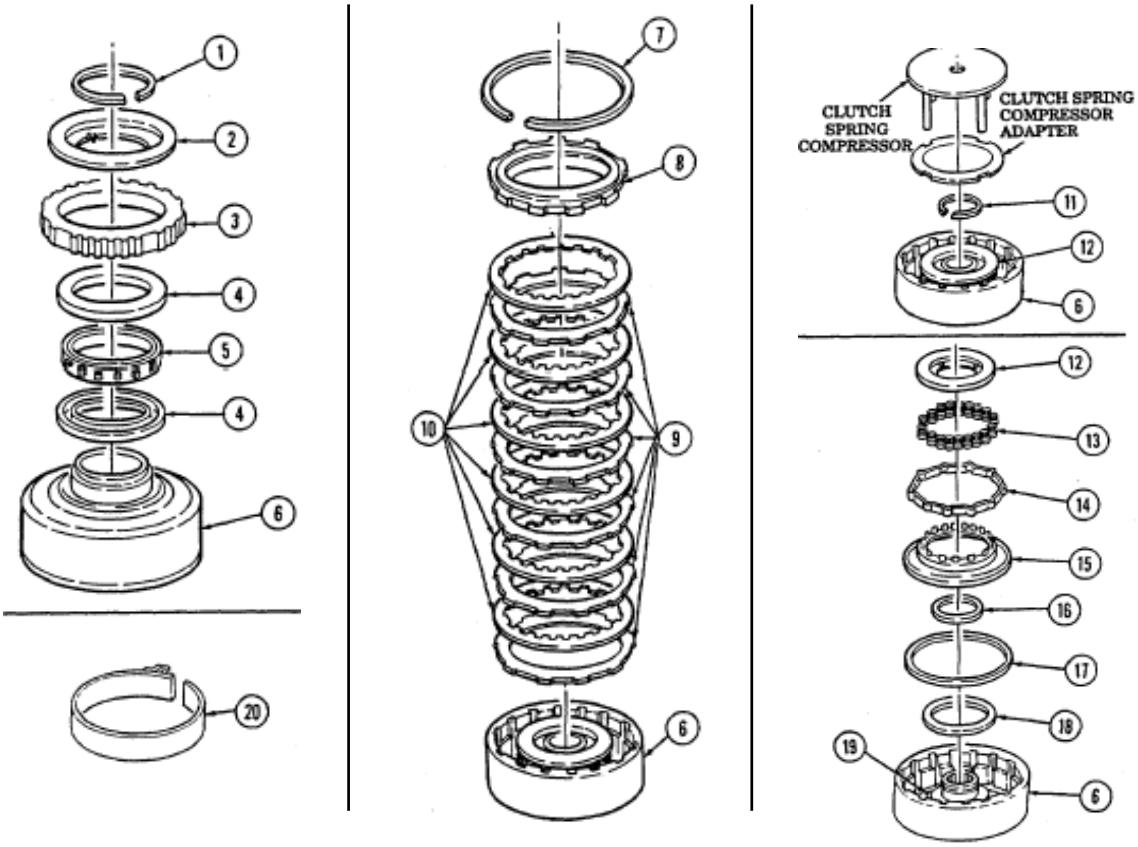
6. Remove inner piston seal (16) and outer piston seal (17) from clutch piston (15). Discard seals (16) and (17).

7. Remove center piston seal (18) from clutch housing (6). Discard seal (18).

8. Remove clutch piston apply ring (14) from clutch piston (15).

3L80 DIRECT CLUTCH AND INTERMEDIATE SPRAG REPAIR - Continued

0009



3L80 DIRECT CLUTCH AND INTERMEDIATE SPRAG REPAIR - Continued 0009

CLEANING

Refer to **Cleaning, WP 0002** for general cleaning instructions.

INSPECTION

NOTE

For general inspection instructions, refer to **WP 0003.**

1. Inspect clutch backing plate (8) and six steel clutch plates (9) for signs of burning, scoring, or cracks. Replace any plate if burnt, scored, or cracked.

2. Inspect sprag retainer snapring (1), backing plate snapring (7), spring retainer (12), and sprag retainer (2) for distortion or damage. Replace any if distorted or damaged.

3. Inspect sprag (5), sprag bushings (4), and outer sprag race (3) for scoring, galling, or damage. Replace any if scored, galled, or damaged.

4. Inspect clutch piston (15) for distortion or damage. Replace if distorted or damaged.

5. Inspect clutch release springs (13) for collapsed coils or distortion. Replace all if any are collapsed or distorted.

6. Inspect direct clutch housing (6) for damage. Replace if damaged.
7. Check for freeness of check ball (19) and ensure all oil passages in clutch housing (6) are open. Replace direct clutch assembly if check ball (19) is not free or oil passages are blocked.

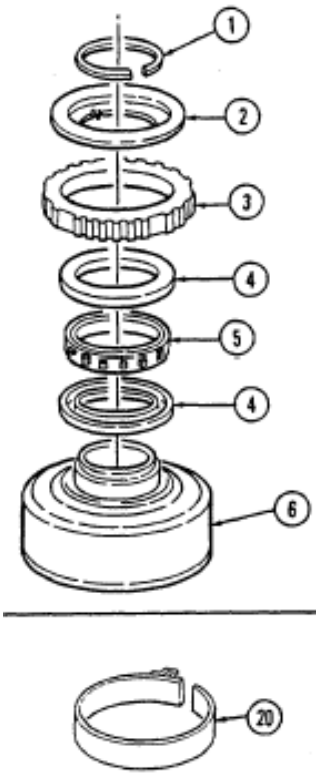
NOTE

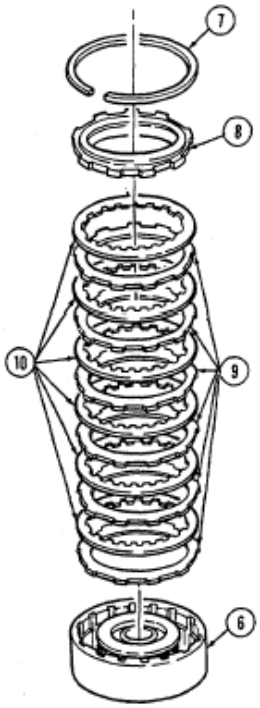
Front band was removed during transmission disassembly

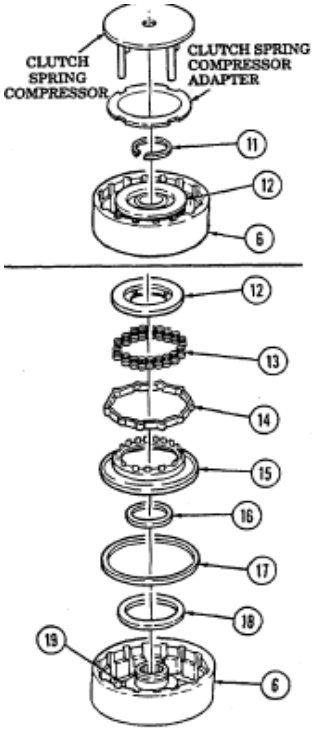
8. Inspect front band (20) for burning, scoring, distortion, or damage. Replace if burnt, scored, distorted, or damaged.

3L80 DIRECT CLUTCH AND INTERMEDIATE SPRAG REPAIR - Continued

0009







3L80 DIRECT CLUTCH AND INTERMEDIATE SPRAG REPAIR - Continued 0009

ASSEMBLY

CAUTION

All transmission parts must be lubricated with clean transmission fluid before assembly. Foreign material will cause transmission damage.

1. Install clutch piston apply ring (3) in clutch piston (5).

2. Install inner piston seal (6) and outer piston seal (7) on clutch piston (5). Ensure lips on piston seals (6) and (8) face away from spring guides (4).

3. Install center piston seal (8) on clutch housing (9). Be sure lip on piston seal (8) faces up.

NOTE

It may be necessary to use 0.015 in. (0.381 mm) feeler gauge to start inner and outer piston seals into clutch housing.

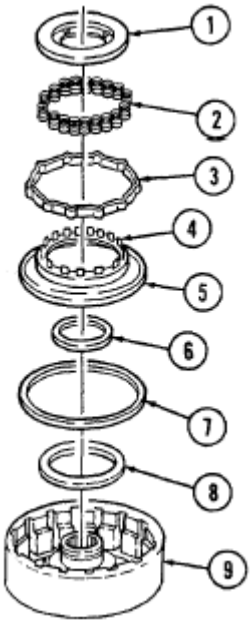
4. Install clutch piston (5) in clutch housing (9).

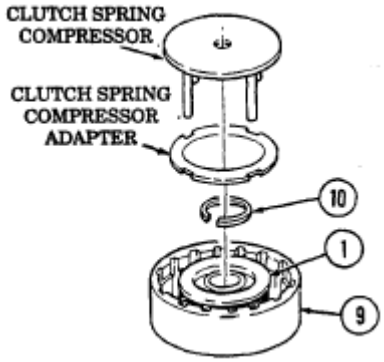
5. Install fourteen release springs (2) and spring retainer (1) on clutch piston (5).

6. Using press, clutch spring compressor and clutch spring compressor adapter, compress spring retainer (1).

7. Install snapring (10) securing spring retainer (1) to clutch housing (9).

8. Remove clutch spring compressor and clutch spring compressor adapter from clutch housing (9).

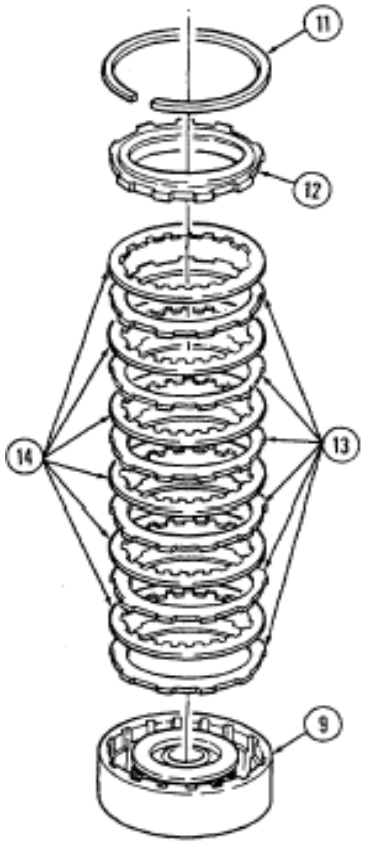




3L80 DIRECT CLUTCH AND INTERMEDIATE SPRAG REPAIR - Continued 0009

9. Install six steel clutch plates (13) and six composition clutch plates (14) in clutch housing (9). Start with steel clutch plate (13) then alternate composition clutch plates (14) and steel clutch plates (13).

10. Install clutch backing plate (12) on clutch housing (9) with snapring (11).



3L80 DIRECT CLUTCH AND INTERMEDIATE SPRAG REPAIR - Continued 0009

11. Install sprag bushing (20) cup side up over inner sprag race (21).

12. Install sprag (19) into outer sprag race (17).

CAUTION

Outer sprag race should not turn counterclockwise after installation or transmission damage will result.

NOTE

If outer sprag race turns counterclockwise, sprag is installed upside down.

13. Install sprag (19) and outer sprag race (17) over inner sprag race (21) with shoulder on inner cage of sprag (19) facing down and rotate until seated on lower sprag bushing (20).

14. Install upper sprag bushing (18) cup side down into outer sprag race (17).

15. Install sprag retainer (16) on clutch housing (9) with snapring (15).

16. Place clutch housing (9) on center support (23).

WARNING

Air pressure must not exceed 50 psi (345 kPa) when air checking clutch piston, or injury to personnel or damage to equipment may result.

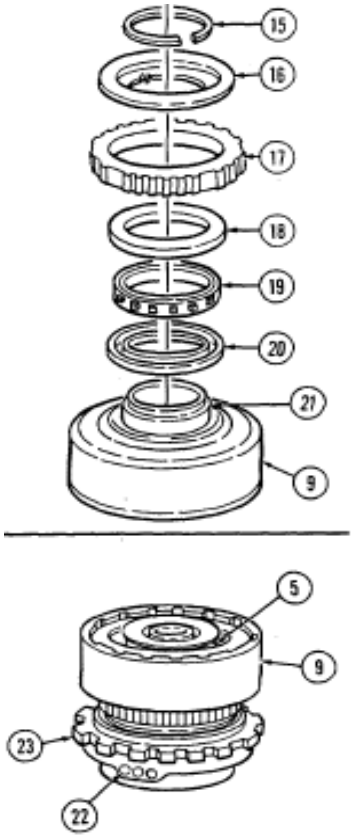
NOTE

- If air is applied through reverse passage (right oil feed hole), it will escape from direct clutch passage (left oil feed hole). This is considered normal
- Clutch piston must move up and down freely when air pressure is applied.

17. Apply air pressure through left oil feed hole (22) to check operation of clutch piston (5).

3L80 DIRECT CLUTCH AND INTERMEDIATE SPRAG REPAIR - Continued

0009



END OF TASK

3L80 CENTER SUPPORT REPAIR 0010

THIS WORK PACKAGE (WP) COVERS:

Disassembly; Cleaning; Inspection; Assembly

INITIAL SETUP:

Tools

General mechanic's tool kit: automotive	(NSN 5180-00-177-7033)

Special Tools

Driver handle	(NSN 5120-00-677-2259); P/N J 8092
Bushing service set	(NSN 5180-01-195-9777); P/N J 21465-01

Materials/Parts

Inner piston seal	(NSN 5330-01-155-4383); P/N 8627627
Outer piston seal	(NSN 5330-01-155-4382); P/N 8623143
Four oil seal rings	(NSN 5330-01-165-4333); P/N 8626356
Transmission fluid	(NSN 9150-00-698-2382) – 1 Quart Can (NSN 9150-01-144-9968) – 55 Gallon Can

Equipment Condition

Transmission disassembled into subassemblies

General Safety Instructions

Air pressure must not exceed 15 psi (103 kPa) when air check clutch piston.

NOTE

Work area should be well ventilated, clean, and free from blowing dirt and dust.

3L80 CENTER SUPPORT REPAIR - Continued 0010

DISASSEMBLY

1. Remove four oil seal rings (1) from center support (2). Discard oil seal rings (1).

2. Compress spring retainer (11), and remove snapring (5) and spring retainer (11) from center support (2).

3. Remove three release springs (10), spring guide (9), and clutch piston (6) from center support (2).

4. Remove inner piston seal (7) and outer piston seal (8) from clutch piston (6). Discard piston seals (7) and (8).

CLEANING

Refer to **Cleaning, WP 0002** for general cleaning instructions.

INSPECTION

NOTE

For general inspection instructions, refer to **WP 0003**.

1. Inspect roller clutch inner race (3) for damage. Replace center support (2) if damaged.

2. Inspect oil ring grooves (4) in center support (2) for roughness or damage. Replace center support (2) if damaged.

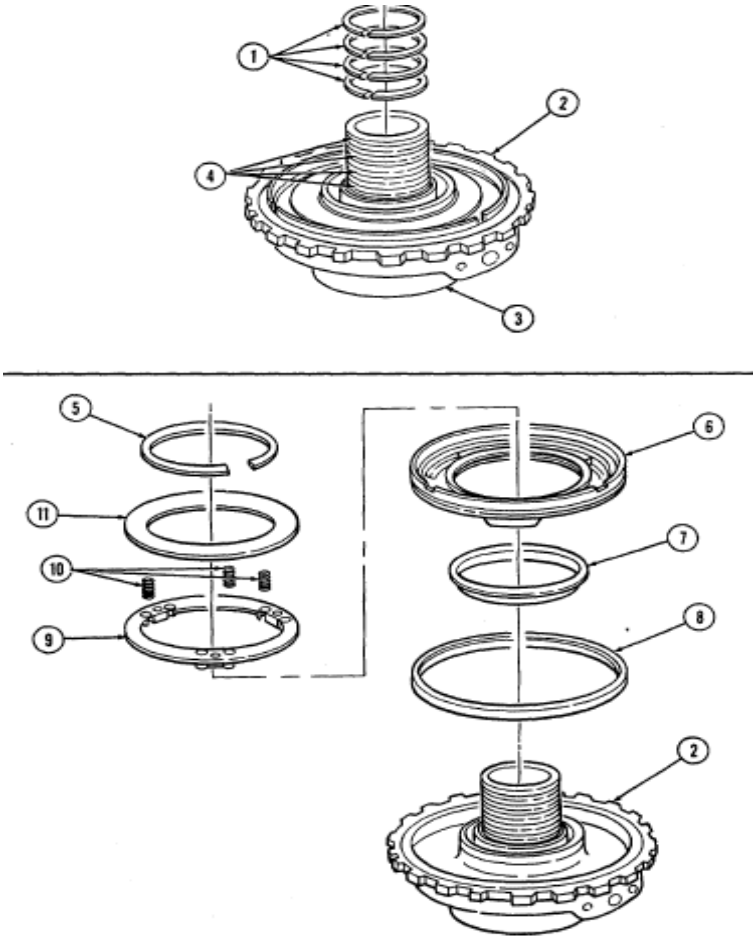
3. Inspect center support (2) for damage. Replace if damaged.

4. Check all oil passages in center support (2) for blockage.

5. Inspect release springs (10) for signs of distortion or collapsed coils. Replace all springs (10) if any have distorted or collapsed coils.

6. Inspect clutch piston (6), spring guide (9), spring retainer (11), and snapring (5) for damage or distortion. Replace any part if damaged or distorted.

3L80 CENTER SUPPORT REPAIR - Continued 0010



3L80 CENTER SUPPORT REPAIR - Continued 0010

NOTE

Intermediate clutch plates and backing plate were removed during transmission disassembly.

7. Inspect steel clutch plates (1) and backing plate (2) for signs of burning, scoring, or cracks. Replace any that are burned, scored, or cracked.

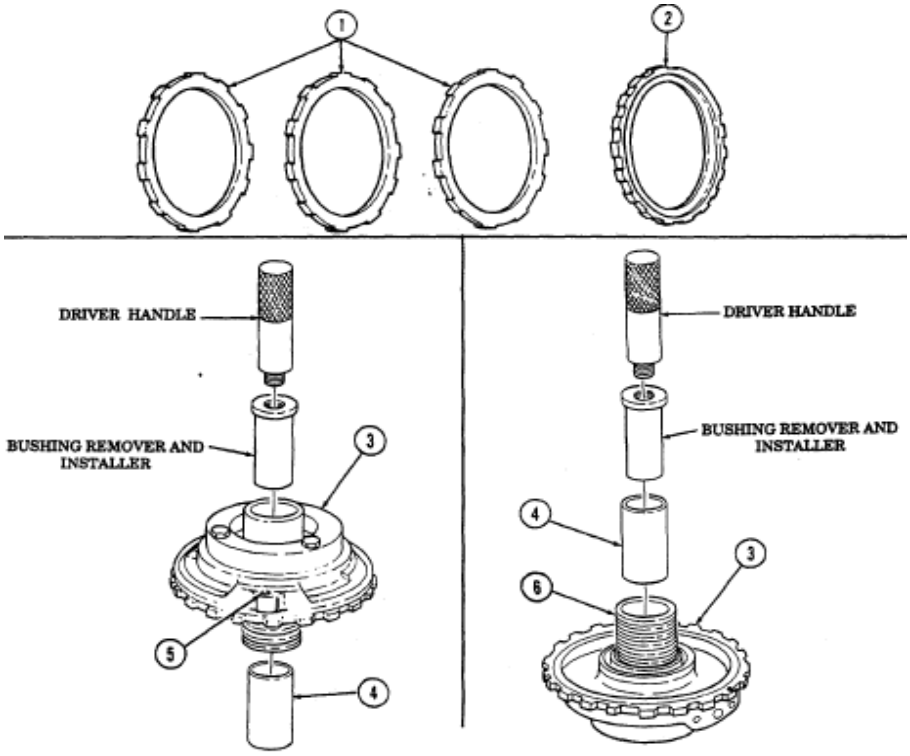
8. Inspect bushing (4) in center support (3) for damage. If damaged, perform steps 9 through 11. If not, go to step 12.

9. Using driver handle and bushing remover and installer J21465-6, remove bushing (4) from center support (3).

10. Align elongated slot in bushing (4) with drilled hole in oil delivery sleeve (6) closest to piston cavity in center support (3).

11. Using driver handle and bushing remover and installer J21465-6, install bushing (4) into center support (3) until bushing (4) is flush to 0.010 in. (0.254 mm) below top of oil delivery sleeve (6).

12. Check center support (3) for obstructions in orifice plug (5). Remove obstructions with a piece of wire. Replace center support if plug (5) is missing or obstructions cannot be removed.



3L80 CENTER SUPPORT REPAIR - Continued 0010

ASSEMBLY

CAUTION

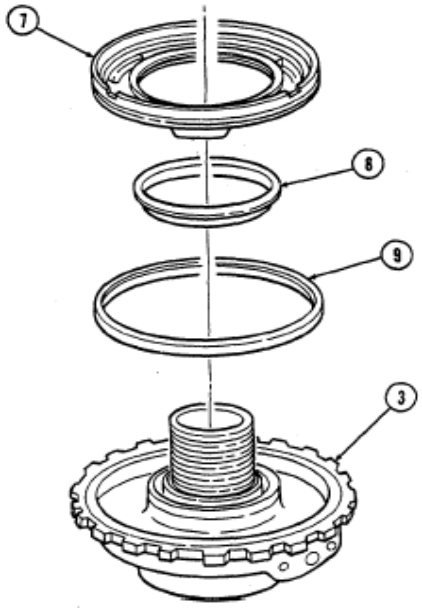
All transmission parts must be lubricated with clean transmission fluid before assembly. Foreign material will cause transmission damage.

NOTE

It may be necessary to use a 0.015 in. (0.381 mm) feeler gauge to start outer and inner piston seals into center support.

1. Install inner piston seal (8) and outer piston seal (9) on clutch piston (7). Ensure lips on piston seals (8) and (9) face away from spring pockets in clutch piston (7).

2. Install clutch piston (7) in center support (3), indexing spring pockets in clutch piston (7) with cored areas in center support (3).

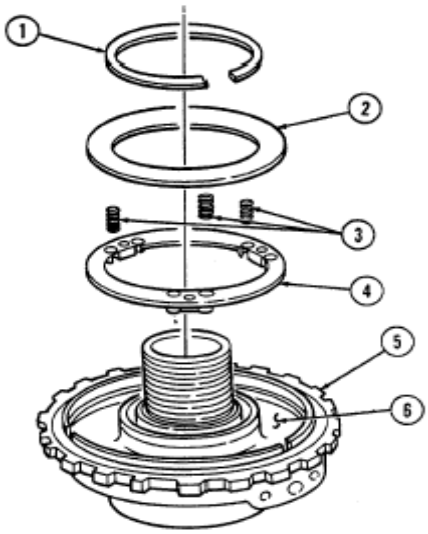


3L80 CENTER SUPPORT REPAIR - Continued 0010

3. Install spring guide (4) and three release springs (3) evenly spaced in clutch piston (6).

4. Place spring retainer (2) on release springs (3).

5. Compress release springs (3) and install snapring (1) securing spring retainer (2) to center support (5).



3L80 CENTER SUPPORT REPAIR - Continued 0010

WARNING

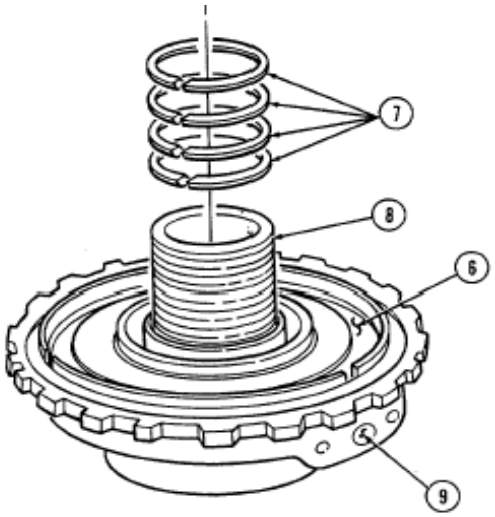
Air pressure must not exceed 15 psi (103 kPa) when air checking clutch piston, or injury to personnel or damage to equipment may result.

NOTE

Clutch piston must move and down freely when air pressure is applied.

6. Apply compressed air through center support bolt hole (9) to check operation of clutch piston (6).

7. Install four oil seals rings (7) on oil delivery sleeve (8). Ensure lap joints on oil seal rings (7) are properly joined.



END OF TASK

3L80 GEAR UNIT REPAIR 0011

THIS WORK PACKAGE (WP) COVERS:

Disassembly; Cleaning; Inspection; Assembly

INITIAL SETUP:

Tools

General mechanic's tool kit: automotive	(NSN 5180-00-177-7033)

Special Tools

Driver handle	(NSN 5120-00-677-2259); P/N J 8092
Bushing service set	(NSN 5180-01-195-9777); P/N J 21465-01
Slide hammer adapter	(NSN 5120-01-130-8865); P/N J 6471-2
Gear unit holding tool	(NSN 4910-01-178-8865); P/N J 21795-02

Materials/Parts

Petrolatum	(NSN 9150-00-250-0926) – 1 ¾ Lb Can
	(NSN 9150-00-250-0933) – 7 ½ Lb Can
Transmission fluid	(NSN 9150-00-698-2382) – 1 Quart Can
	(NSN 9150-01-144-9968) – 55 Gallon Can

Equipment Condition

Transmission disassembled into subassemblies.

NOTE

Work area should be well ventilated, clean, and free from blowing dirt and dust.

3L80 GEAR UNIT REPAIR - Continued 0011

DISASSEMBLY

1. Remove roller clutch (1) from reaction carrier (2).

2. Remove reaction carrier (2) from output carrier (8)

NOTE

Keep all thrust bearings and races together as sets.

3. Remove race (3), sun gear thrust bearing (9), and race (3) from sun gear shaft (4). Tag thrust bearing (9) and races (3) for assembly.

4. Remove sun gear shaft (4), sun gear (5), front internal gear ring (6), and reaction carrier thrust washer (7) from output carrier (8).

5. Turn output carrier (8) over.

6. Remove snapring (11) from output shaft (12) and output carrier (8).

7. Remove case thrust washer (10) and output shaft (12) from output carrier (8).

8. Remove two races (13) and output shaft thrust bearing (18) from rear internal gear (14). Tag thrust bearing (18) and races (13) for assembly.

9. Remove rear internal gear (14) and mainshaft (15) from output carrier (8).

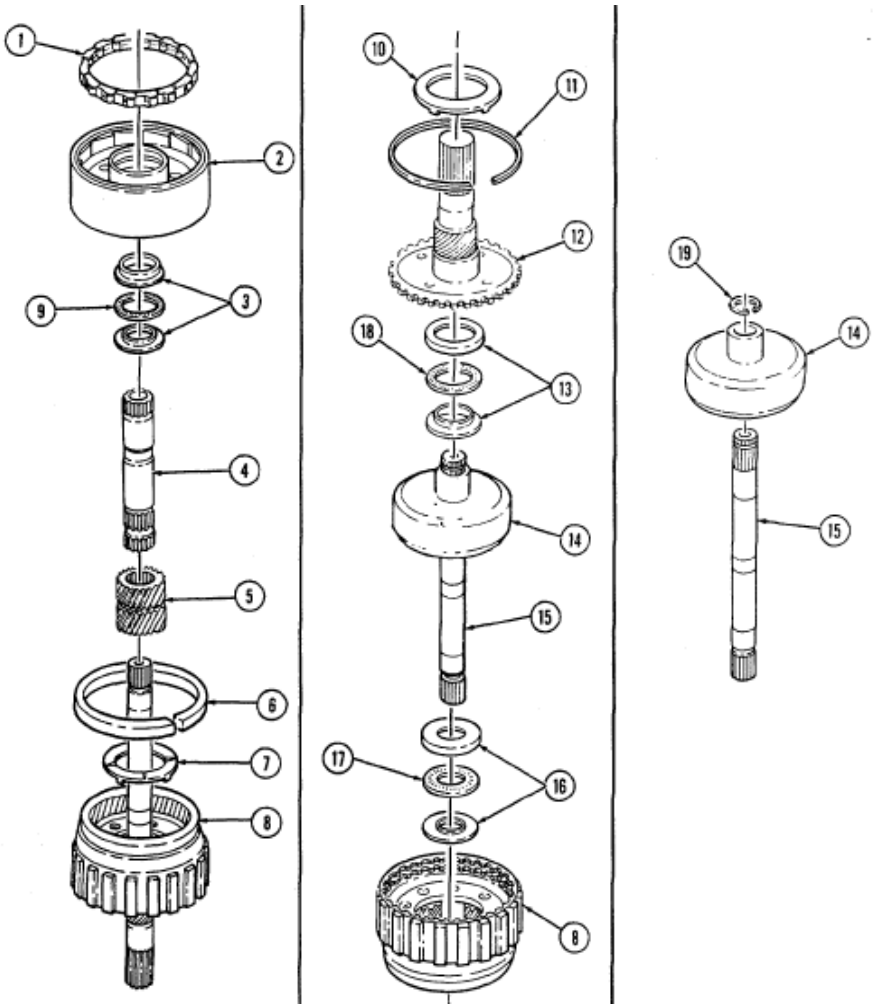
10. Remove two races (16) and rear internal gear thrust bearing (17) from output carrier (8). Tag thrustbearing (17) and races (16) for assembly.

11. Remove snapring (19) and mainshaft (15) from rear internal gear (14).

CLEANING

Refer to **Cleaning WP 0002** for general cleaning instructions.

3L80 GEAR UNIT REPAIR - Continued 0011



3L80 GEAR UNIT REPAIR - Continued 0011

INSPECTION

NOTE

For general inspection instructions, refer to **WP 0003**.

1. Inspect output carrier (2) for damage. Replace if damaged.

2. Inspect output carrier pinion gears (1) for damage, rough bearings, or excessive end play. Using feeler gauge, measure pinion gear end play; end play should not exceed 0.024 in. (0.61 mm). If any of these conditions exist, replace output carrier (2).

3. Inspect band surface (4) on reaction carrier (3) for burning, scoring, or galling. Replace if burnt, scored, or galled.

4. Inspect reaction carrier bushing (5). Replace reaction carrier (3) if bushing (5) is damaged.

5. Inspect reaction carrier pinion gear (6) for damage, rough bearings, or excessive end play. Using feeler gauge, measure pinion gear end play; end play should not exceed 0.024 in. (0.61 mm). If any of these conditions exist, replace reaction carrier (3).

6. Inspect roller clutch (10) for damaged rollers (8), springs (7), or cage (9). Replace roller clutch (10) if any parts are damaged.

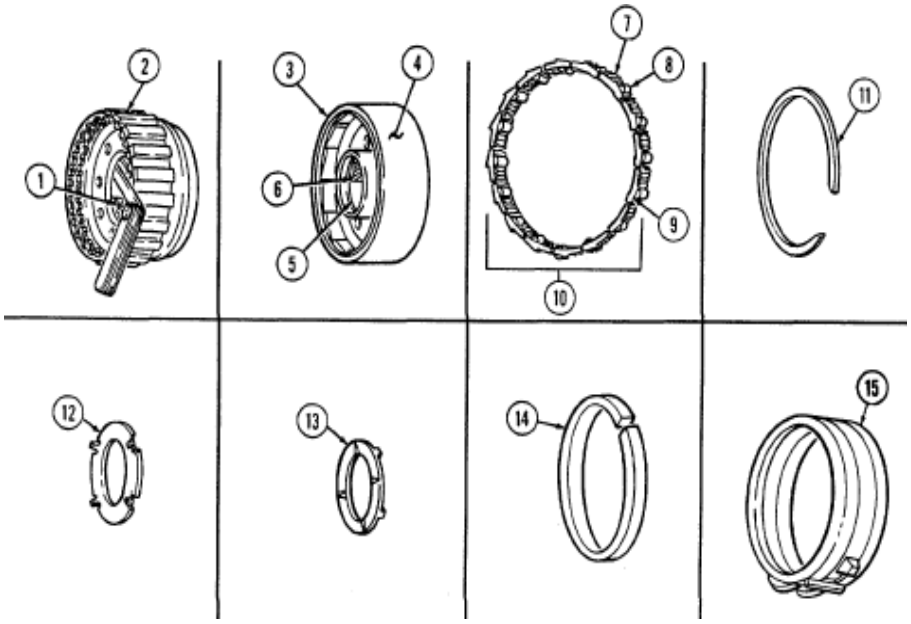
7. Inspect snapring (11), case thrust washer (12), reaction carrier thrust washer (13), and front internal gear ring (14) for distortion or damage. Replace any part distorted or damaged.

NOTE

Rear band was removed during transmission disassembly **WP 0005**

8. Inspect rear band (15) for burning, scoring, distortion, or other damage. Replace if burnt, scored, distorted, or otherwise damaged.

3L80 GEAR UNIT REPAIR - Continued 0011



3L80 GEAR UNIT REPAIR - Continued 0011

9. Inspect sun gear shaft bushings (16) for damage. If damaged, perform steps 10 and 11, if not, go to step 12.

10. Using bushing remover J21465-15, slide hammer adapter and slide hammer, remove bushing (16) from sun gear shaft (17). Discard bushing (16).

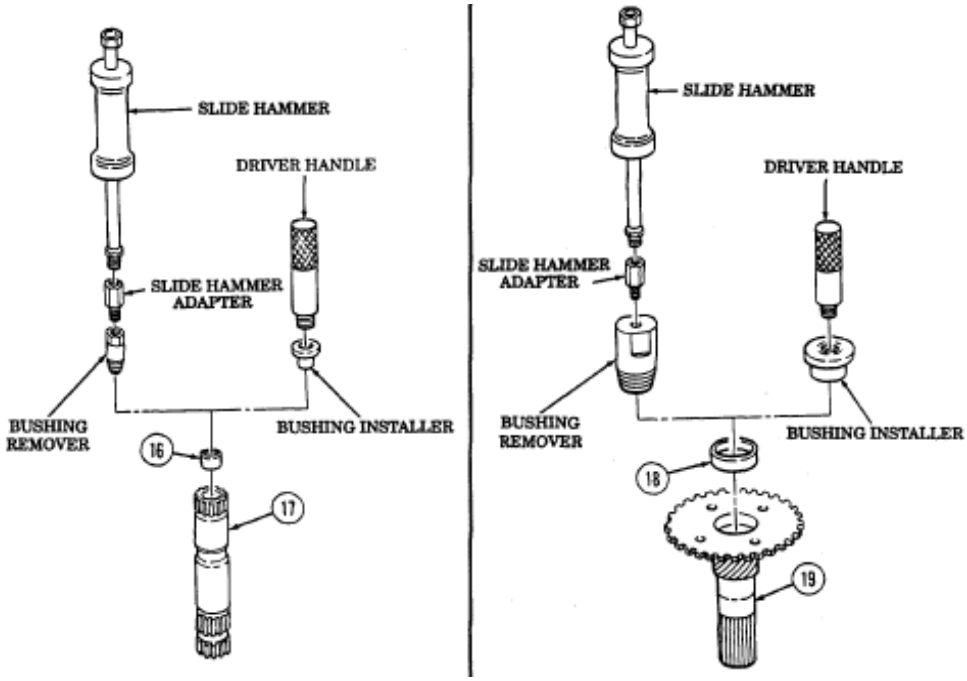
11. Using driver handle and bushing installer J21465-5, install bushing (16) in sun gear shaft (17).

12. Inspect output shaft bushing (18) for damage. If damaged, perform steps 13 and 14, if not, go to step 15.

13. Using bushing remover J21465-16, slide hammer adapter and slide hammer, remove bushing (18) from output shaft (19). Discard bushing (18).

14. Using driver handle and bushing installer J21465-1, install bushing (18) in output shaft (19).

15. Refer to **INSPECTION, WP 0003** for general inspection for all other gear unit parts.



3L80 GEAR UNIT REPAIR - Continued 0011

ASSEMBLY

CAUTION

All transmission parts must be lubricated with clean transmission fluid before assembly. Foreign material will cause transmission damage.

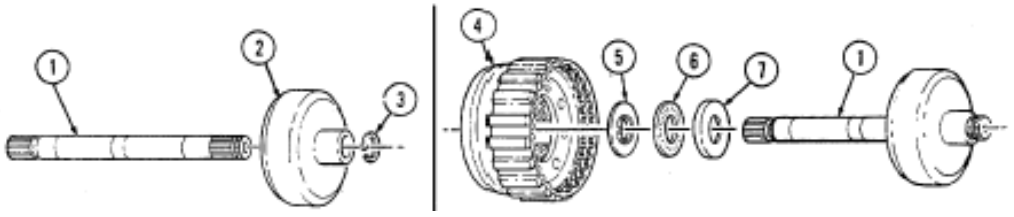
NOTE

If replacing mainshaft, make sure orifice cup plug in service mainshaft is removed.

1. Install mainshaft (1) in rear internal gear (2) and secure with snapring (3).

2. Install large bearing race (7), thrust bearing (6), and small bearing race (5) (with inside diameter flange facing thrust bearing (6)) on mainshaft (1).

3. Install output carrier (4) on mainshaft (1) and rotate carrier (4) until seated.



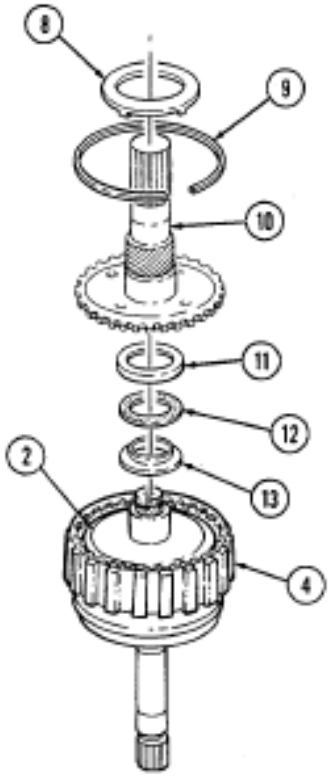
3L80 GEAR UNIT REPAIR - Continued 0011

4. Install small diameter bearing race (13) (with inside diameter flange facing up), thrust bearing (12), and large bearing race (11) (with outside diameter flange facing thrust bearing (12)) on rear internal gear (2).

5. Install output shaft (10) on output carrier (4) and secure with snapring (9).

6. Install case thrust washer (8) on output shaft (10) and retain with petrolatum.

7. Turn gear unit over.



3L80 GEAR UNIT REPAIR - Continued 0011

8. Install reaction carrier thrust washer (23) on output carrier (4) with tabs on thrust washer (23) fitting in pockets in output carrier (4).

9. Install sun gear (21) on mainshaft (1), with bevel on inside diameter splines (20) facing down, and into output carrier (4).

NOTE

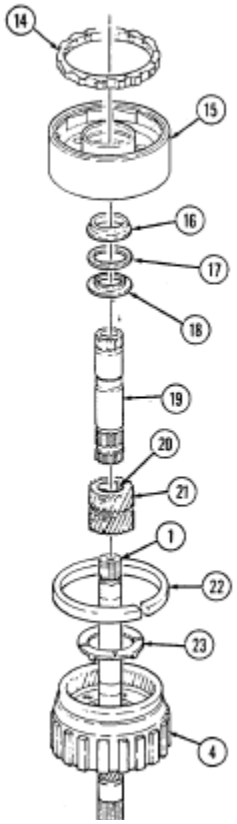
When a new output carrier and/or reaction carrier is being installed and front internal gear ring prevents assembly of carriers, replace front gear ring with replacement gear ring.

10. Install front internal gear ring (22) and reaction carrier (15) on output carrier (4) so pinion gears mesh with sun gear (21).

11. Install sun gear shaft (19) into sun gear (21) with long splines fitting into sun gear (21).

12. Install large bearing race (18) (with inside diameter flange facing up), thrust bearing (17), and small bearing race (16) (with inside diameter facing up) on sun gear shaft (19).

13. Install roller clutch (14) in reaction carrier (15).



3L80 GEAR UNIT REPAIR - Continued 0011

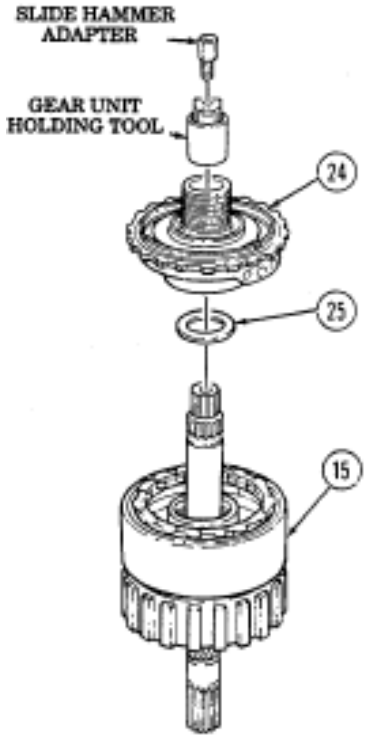
14. Install center support thrust washer (25) in recess of center support (24). Retain thrust washer (25) with petrolatum.

NOTE

With reaction carrier held, center support should only turn counterclockwise.

15. Install center support (24) in reaction carrier (15).

16. Install gear unit holding tool and slide hammer adapter to hold assembly together.



END OF TASK

3L80 REAR SERVO REPAIR 0012

THIS WORK PACKAGE (WP) COVERS:

Disassembly; Cleaning; Inspection; Assembly

INITIAL SETUP:

Tools

General mechanic's tool kit automotive (NSN 5180-00-177-7033)

Equipment Condition

Transmission disassembled into subassemblies.

NOTE

Work area should be well ventilated, clean, and free from blowing dirt and dust.

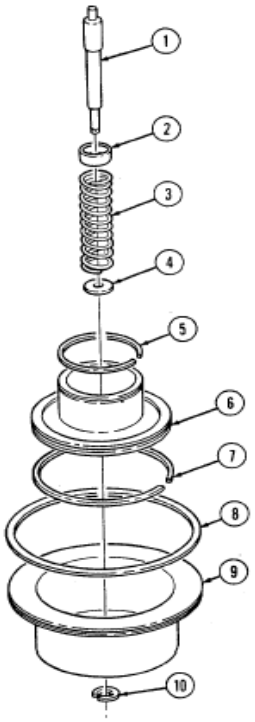
DISASSEMBLY

1. Remove rear accumulator piston (6) from rear servo piston (9).

CAUTION

Band apply pin is spring loaded.

2. Remove E-ring (10) from band apply pin (1) and remove band apply pin (1), washer (4), spring (3), and spring retainer (2) from rear servo piston (9).



3L80 REAR SERVO REPAIR - Continued 0012

CLEANING

Clean all rear servo components in accordance with **WP 0002**.

INSPECTION

NOTE

- For general inspection instructions, refer to **WP 0003**.
- Do not remove oil seal rings from accumulator piston or servo piston unless oil seals require replacement.

1. Inspect accumulator piston oil seal rings (7) and (5) for damage. Replace rings (7) or (5) if damaged.

2. Inspect servo piston oil seal (8) for nicks, cuts, or damage. Replace seal (8) if nicked, cut, or damaged.

3. Inspect accumulator piston (6) and servo piston (9) for damage. Replace either if damaged.

4. Inspect band apply pin (1) for scoring or damage. Replace pin (1) if scored or otherwise damaged.

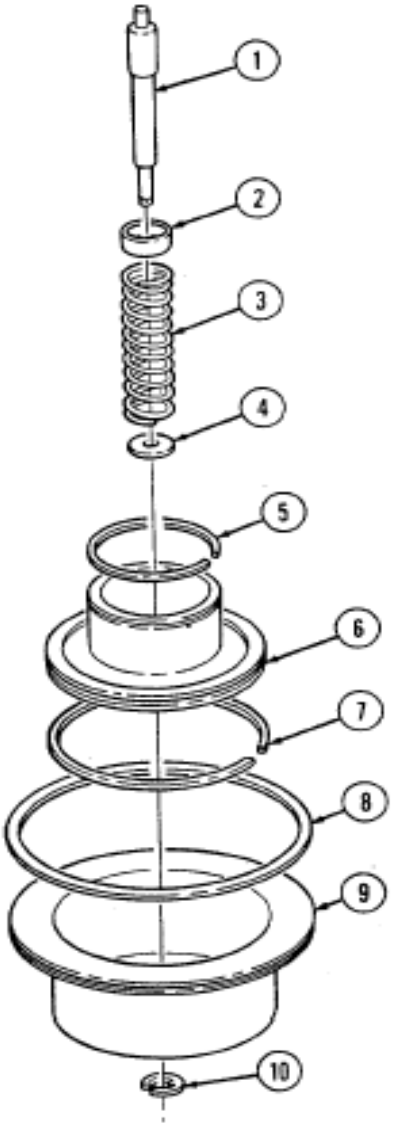
ASSEMBLY

1. Install spring retainer (2), spring (3), and washer (4) on band apply pin (1).

2. Install band apply pin (1) into rear servo piston (9) and secure with E-ring (10).

3. Install accumulator piston (6) into rear servo piston (9).

3L80 REAR SERVO REPAIR - Continued 0012



END OF TASK

3L80 GOVERNOR REPAIR 0013

THIS WORK PACKAGE (WP) COVERS:

Cleaning and Inspection

INITIAL SETUP:

Tools

General mechanic's tool kit automotive (NSN 5180-00-177-7033)

Equipment Condition

Governor removed

CLEANING

Clean governor in accordance with **WP 0002**.

INSPECTION

Note

Refer to **INSPECTION, WP 0003** for general inspection instructions.

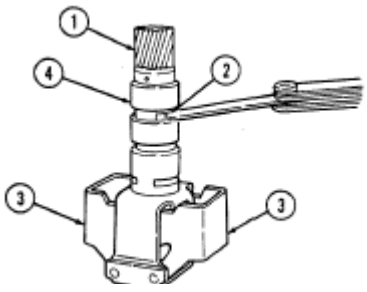
1. Inspect governor (4) for scoring or damage. Replace if scored or damaged.

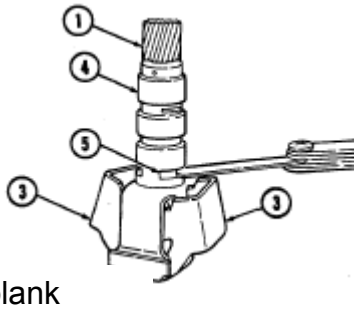
2. Inspect gear (1) for damage. Replace governor (4) if gear (1) is damaged.

3. Check governor weights (3) for free operation. Replace governor (4) if weights (3) are binding.

4. Allow governor weights (3) to hang in their outward position. Using feeler gauge, measure valve opening at governor intake (2). Minimum valve opening is 0.020 in. (0.50 mm). Replace governor (4) if opening does not meet specifications.

5. Hold governor weights (3) inward. Using feeler gauge, measure valve opening at governor exhaust (5). Minimum valve opening is 0.020 in. (0.50 mm). Replace governor (4) if valve opening does not meet specifications.





END OF TASK

3L80 TRANSMISSION ASSEMBLY FROM SUBASSEMBLIES 0014

THIS WORK PACKAGE (WP) COVERS:

a. Rear Band; b. Gear Unit and Center Support; c. Establish Rear End Play; d. Intermediate Clutch; e. Front Band; f. Manual Linkage; g. Direct Clutch; h. Forward Clutch and Turbine Shaft; i. Oil Pump; j. Establish Front End Play; k. Detent Solenoid; l. Front Servo; m. Rear Servo; n. Control Valve; o. Governor; p. Oil Filter; q. Oil Pan; r. Holding Fixture; s. Torque Converter

INITIAL SETUP:

Tools

General mechanic's tool kit automotive	(NSN 5180-00-177-7033)
Dial indicator	(NSN 5210-00-277-8840); P/N 196A

Special Tools

Band apply pin selector gauge	(NSN 4910-01-178-0722); P/N J 21370
Slide hammer adapter	(NSN 5120-01-130-8865); P/N J 6471-2
Gear unit holding tool	(NSN 4910-01-178-8865); P/N J 21795-02
Intermediate clutch alignment tool	(NSN 4910-01-209-0729); P/N J 24396
Torque adapter, 9/16 in.	P/N SRES 19

Materials / Parts

Oil pump gasket	(NSN 5330-01-152-5941); P/N 8623978
Six seal washers	(NSN 5310-01-150-5921); P/N 8626281
Oil pan gasket	(NSN 5330-01-148-7492); P/N 8655625
Governor cover gasket	(NSN 5330-00-001-1984); P/N 8623263
Control valve gasket	(NSN 5330-01-152-5942); P/N 8623561
Oil filter	(NSN 4330-01-121-6350); P/N 6437741
O-ring seal	(NSN 5330-01-080-3253); P/N 12267802
Rear servo cover gasket	(NSN 5330-01-152-5941); P/N 8675728
O-ring seal	(NSN 5330-01-043-5572); P/N 8658110
Manual shaft seal	(NSN 5330-01-251-1607); P/N 8657163
Three composition clutch plates	(NSN 5340-01-150-4104); P/N 8624101
Transmission fluid	(NSN 9150-00-698-2382) – 1 Quart Can (NSN 9150-01-144-9968) – 55 Gallon Can
Petrolatum	(NSN 9150-00-250-0926) – 1 ¾ Pound Can (NSN 9150-00-250-0933) – 7 ½ Pound Can
Center support assembly	(NSN 3120-01-174-8153); P/N 8683075
Two guide pins	Refer to **WP 0015**

CAUTION

All transmission parts must be lubricated with clean transmission fluid before assembly. Foreign material will cause transmission damage.

3L80 TRANSMISSION ASSEMBLY FROM SUBASSEMBLIES - Continued 0014

NOTE

- During assembly operations, it is important to closely inspect each unit to make sure nothing has been overlooked during inspection and repair. Plugs should be checked for tightness, parts kept clean, openings covered, and machined surfaces protected. Application of lubricant should be performed from covered containers.
- Install transmission holding fixture, refer to **WP 0005**.
- If using new transmission case, discard blue plug and copper plug that are packaged with transmission case. These plugs are not required on M998 and M998A1 vehicles.
- The speedometer drive opening must be plugged with seal plug P/N 8623463 on new transmission case.

a. Rear Band

1. Position front of transmission case (4) up.

2. Install rear band (2) so two lugs on rear band (2) index with anchor pins (6) in case (4). Ensure rear band (2) is seated on anchor pins (6).

b. Gear Unit and Center Support

NOTE

If transmission was manufactured before March 1, 1990 and a new transmission case is to be used, install a new center support assembly.

1. Install rear selective washer (7) in slots (5) inside rear of case (4).

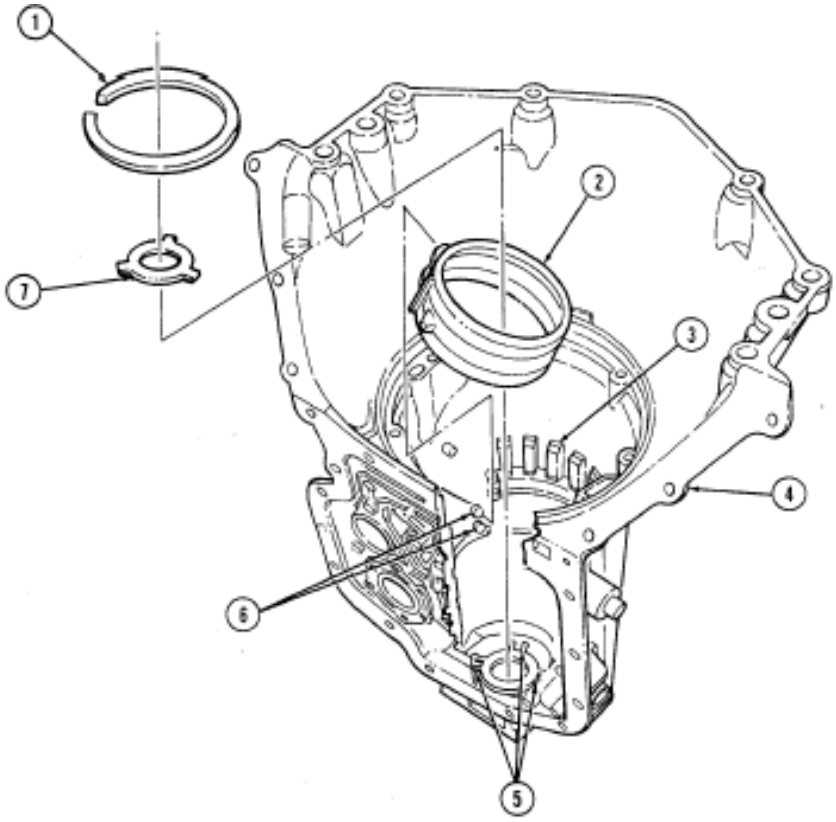
NOTE

Do not confuse center support spacer (0.040 in. (1.016 mm) thick and both sides flat) with either center support snapring (beveled on one side) or intermediate clutch backing plate snapring (0.093 in. (2.362 mm) thick and both ides flat).

2. Install center support to case spacer (1) against shoulder at bottom of case splines (3), and locate gap in spacer (1) adjacent to anchor pins (6).

3L80 TRANSMISSION ASSEMBLY FROM SUBASSEMBLIES - Continued

0014

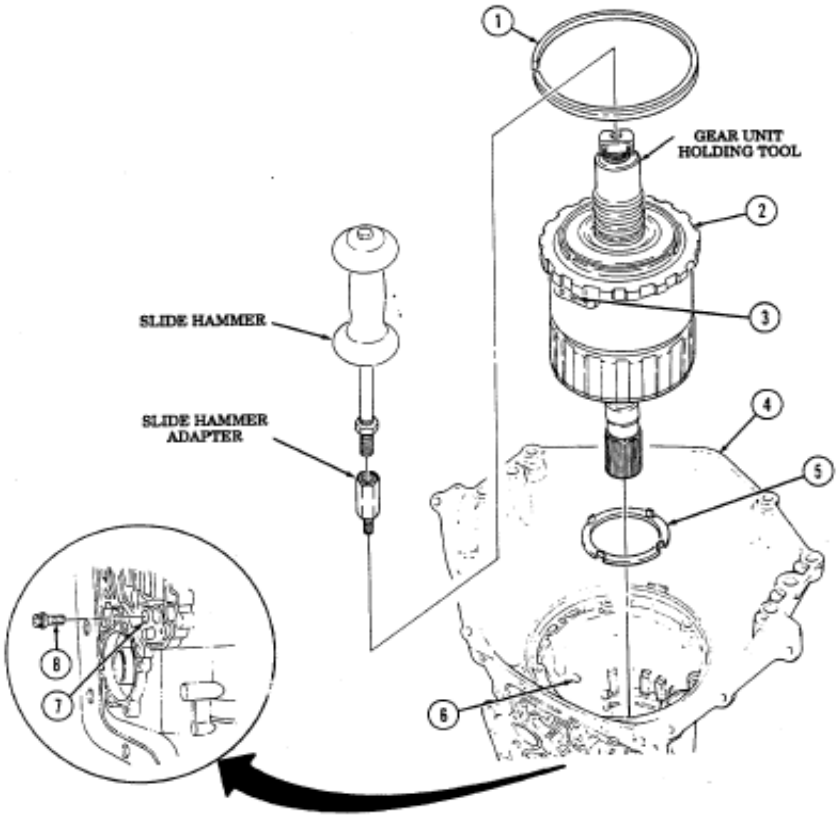


3L80 TRANSMISSION ASSEMBLY FROM SUBASSEMBLIES - Continued 0014

3. Using gear unit holding tool, slide hammer adapter, and slide hammer, install complete gear unit and center support (2) into case (4). Ensure case thrust washer (5) is properly installed on gear unit and center support (2), and center support bolt hole (3) is properly aligned with bolt hole (7) in case (4). Remove installation tools.

4. Lubricate and install center support snapring (1) with beveled side up (flat side against center support) and locate gap in snapring (1) adjacent to front band anchor pin (6). Ensure snapring (1) is properly seated.

5. Install center support alignment bolt (8) through bolt hole (7) in case (4) and into gear unit and center support (2). Using a 3/8 in. 12 point socket, tighten alignment bolt (8) to 20-25 lb-ft (27-34 N•m).



3L80 TRANSMISSION ASSEMBLY FROM SUBASSEMBLIES - Continued 0014

c. Establish Rear End Play

1. Position transmission (4) so that output shaft (9) faces upward.

2. Mount dial indicator on transmission stud (10) and index dial indicator with end of output shaft (9).

3. Move output shaft (9) in and out to rear end play. End play should be 0.007-0.019 in. (0.177- 0.482 mm). The selective washer controlling this end play is the steel washer having three lugs and located between the rear thrust washer and the rear face of the transmission case (4).

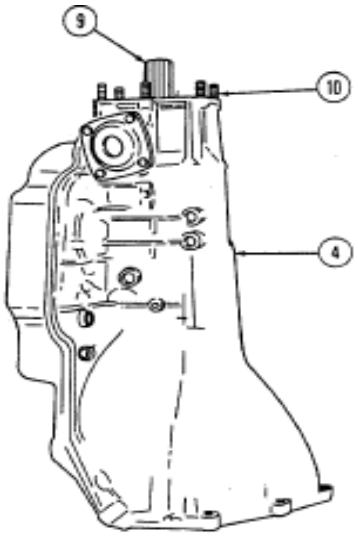
NOTE

If a difference in washer thickness is required to bring end play within specifications, it can be selected from the following chart.

Rear Selective Washer Thickness

	IDENTIFICATION	
THICKNESS	**NOTCHES**	**NUMERAL**
0.078-0.082 in. (1.98-2.08 mm)	None.	1
0.086-0.090 in. (2.18-2.28 mm)	1 tab side	2
0.094-0.098 in. (2.38-2.48 mm)	2 tabs side	3
0.102-0.106 in. (2.59-2.69 mm)	1 tab outer	4
0.110-0.114 in. (2.79-2.89 mm)	2 tabs outer diameter	5
0.118-0.122 in. (2.99-3.09 mm)	3 tabs outer diameter	6

4. If end play is not within specifications, remove selective washer and install a new selective washer of proper thickness.



3L80 TRANSMISSION ASSEMBLY FROM SUBASSEMBLIES - Continued 0014

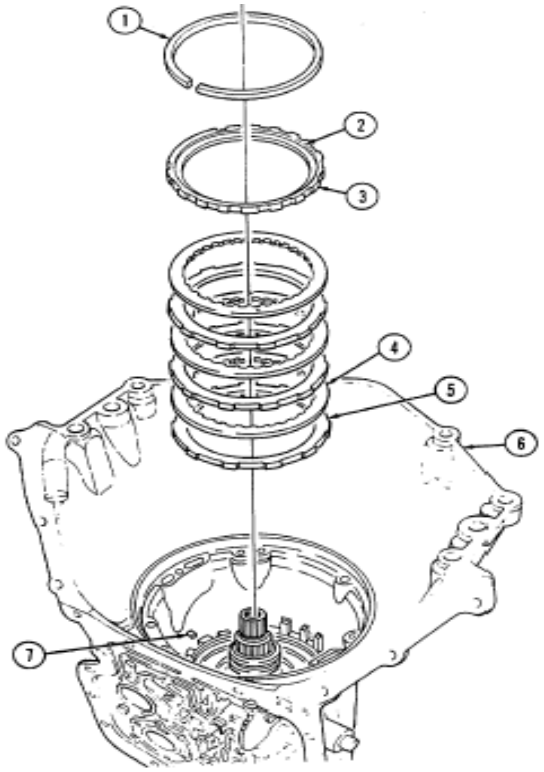
d. Intermediate Clutch

1. Position front of case (6) up.

2. Soak composition clutch plates (4) in transmission fluid.

3. Install three steel clutch plates (5) and composition clutch plates (4) in case (6). Start with steel clutch plate (5) then alternate between composition clutch plates (4) and steel clutch plates (5).

4. Install intermediate clutch backing plate (3), with ridge (2) facing up, and snapring (1). Locate gap in snapring (1) opposite front band anchor pin (7).



3L80 TRANSMISSION ASSEMBLY FROM SUBASSEMBLIES - Continued 0014

e. Front Band

Install front band (9) in case (6) and position band anchor hole (8) on band anchor pin (7).

f. Manual Linkage

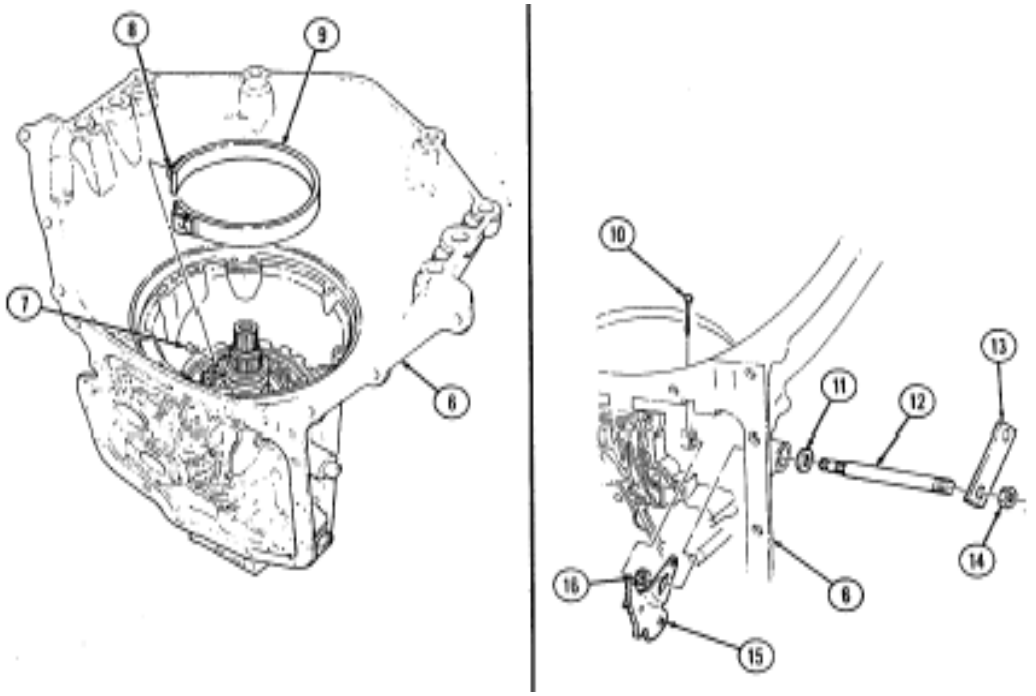
1. Install manual shaft seal (11) in case (6).

2. Install manual shaft (12) in case (6).

3. Install detent lever (15) and jam nut (16) on manual shaft (12). Using 9/16 in. torque adapter, tighten jam nut (16) to 15-18 lb-ft (20-24 N•m).

4. Install retaining pin (10) securing manual shaft (12) into case (6).

5. Install shift lever (13) on manual shaft (12) with nut (14). Tighten nut (14) to 15-25 lb-ft (20-34 N•m).



3L80 TRANSMISSION ASSEMBLY FROM SUBASSEMBLIES - Continued 0014

g. Direct Clutch

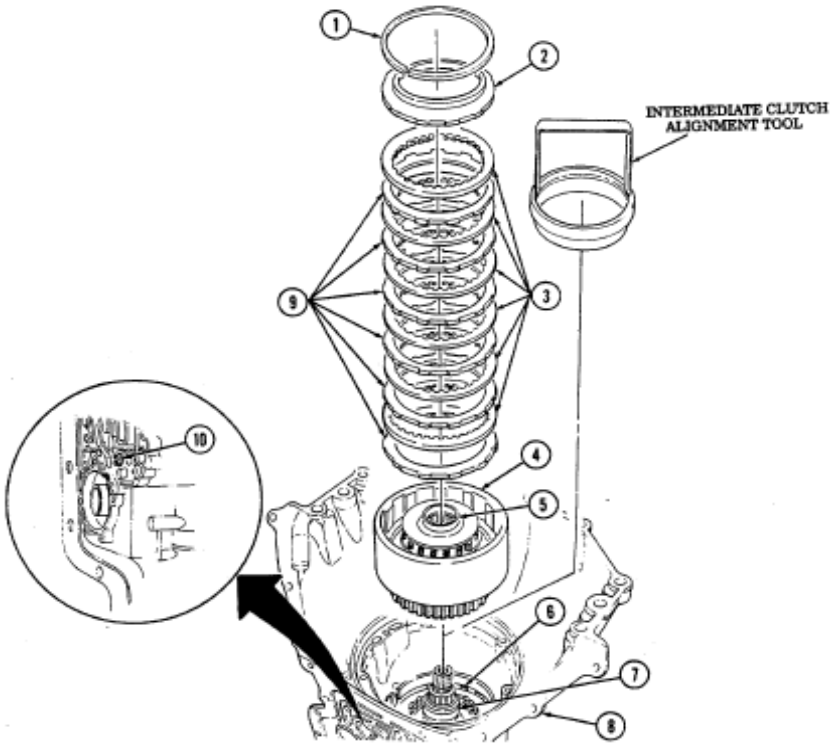
1. Remove snapring (1), direct clutch backing plate (2), six composition clutch plates (3), and steel clutch plates (9) from direct clutch housing (4).

2. Using intermediate clutch alignment tool, align intermediate clutches (6). Apply air pressure through center support bolt (10) to hold clutch plates (6) in place. Remove alignment tool and install direct clutch housing (4) into case (8).

3. Remove air pressure and ensure that direct clutch housing hub (5) bottoms on sun gear shaft (7).

4. Install clutch plates (9) and (3) into direct clutch housing (4) starting with a steel clutch plate (9), then alternating composition clutch plates (3) and steel clutch plates (9).

5. Install direct clutch backing plate (2) in direct clutch housing (4) with snapring (1).



3L80 TRANSMISSION ASSEMBLY FROM SUBASSEMBLIES - Continued 0014

h. Forward Clutch and Turbine Shaft

1. Install forward clutch hub thrust washer (13) on forward clutch housing (12). Retain thrust washer (13) with petrolatum.

NOTE

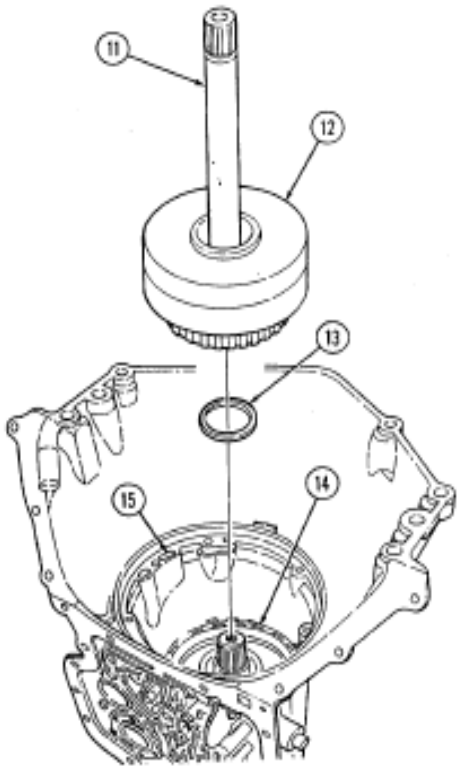
When installing forward clutch and turbine shaft, it may be necessary to rotate and shake forward clutch and turbine shaft assembly to align direct clutch plates with forward clutch housing.

2. Install forward clutch (12) and turbine shaft (11) into direct clutch (14).

CAUTION

The top of the forward clutch housing must be 1-1/4 in. (31.7 mm) from oil pump mounting surface or transmission damage will result.

3. Measure the distance from top of forward clutch housing (12) to oil pump mounting surface (15) to determine if forward clutch (12) is fully engaged with direct clutch (14).



3L80 TRANSMISSION ASSEMBLY FROM SUBASSEMBLIES - Continued 0014

i. Oil Pump

1. Install two guide pins in case (5).

2. Coat oil sealing rings on oil pump (1) with petrolatum.

3. Install oil pump gasket (4) over guide pins.

4. Install oil pump (1) over guide pins and into case (5).

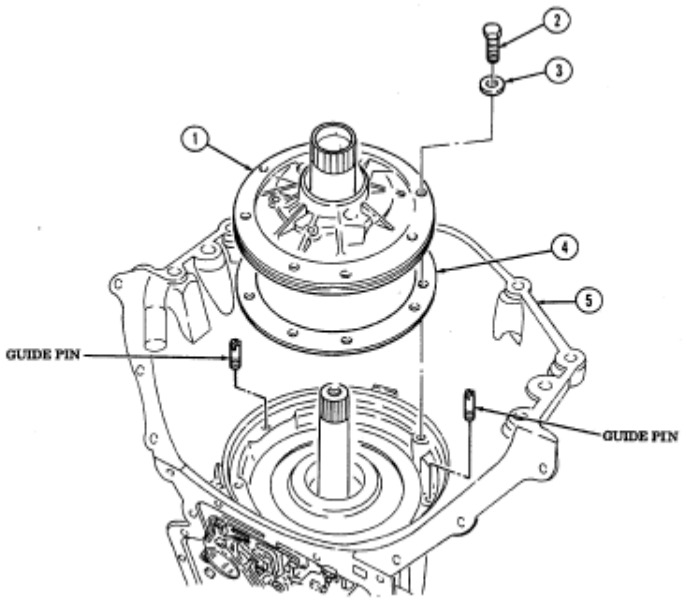
5. Using wooden handle, lightly tap oil pump (1) into case (5) far enough to start capscrews (2).

6. Remove guide pins and install five seal washers (3) and capscrews (2). Leave one threaded capscrew hole in oil pump (1) open.

CAUTION

If turbine shaft cannot be rotated as pump is being pulled in place, forward or direct clutch housing has not been properly installed. This condition must be corrected before oil pump is pulled fully in place or transmission damage will result.

7. Evenly tighten capscrews (2) securing oil pump (1) to case (5) to 16-20 lb-ft (22-27 N•m).



3L80 TRANSMISSION ASSEMBLY FROM SUBASSEMBLIES - Continued 0014

j. Establish Front End Play

1. Position case (5) so that oil pan sealing surface (7) faces upward.

2. Install slide hammer bolt (6) into capscrew hole in oil pump (1).

3. Mount dial indicator on bolt (6) and index indicator to register with end of turbine shaft (9).

4. Push turbine shaft (9) rearward.

5. Push output shaft (8) forward, and “zero” dial indicator.

6. Pull turbine shaft (9) forward, and read dial indicator.

NOTE

Selective washer controlling end play is located between pump cover and forward clutch housing; refer to **WP 0008**. If more or less washer thickness is required to bring end play within specifications, select proper washer from the chart below.

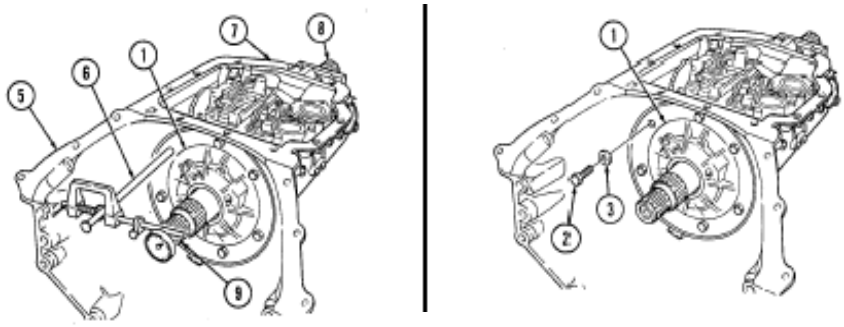
An oil soaked washer may tend to discolor. It will be necessary to measure washer for its actual thickness.

Front Selective Washer Thickness

THICKNESS	COLOR
0.060-0.064 in. (1.52-1.63 mm)	Yellow
0.071-0.075 in. (1.80-1.90 mm)	Blue
0.082-0.086 in. (2.08-2.18 mm)	Red
0.093-0.097 in. (2.36-2.46 mm)	Brown
0.104-0.108 in. (2.64-2.74 mm)	Green
0.115-0.119 in. (2.92-3.02 mm)	Black
0.126-0.130 in. (3.20-3.30 mm)	Purple

7. Resulting travel or end play should be 0.003-0.024 in. (0.076-0.610 mm). If end play is not within specifications, remove selective washer and install new selective washer of proper thickness.

8. Remove dial indicator and bolt (6). Install remaining oil pump seal washer (3) and capscrew (2) in oil pump (1). Tighten capscrew (2) to 16-20 lb-ft (22-27 N•m).



3L80 TRANSMISSION ASSEMBLY FROM SUBASSEMBLIES - Continued 0014

NOTE

Install six check balls only; the seventh check ball is not required.

k. Detent Solenoid

1. Install six check balls (2) in ballseat pockets in case (1).

2. Install two guide pins in case (1).

NOTE

Spacer plate gasket is marked "C".

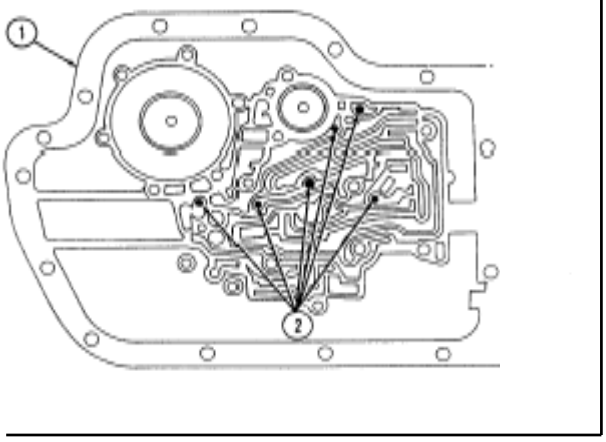
3. Install spacer plate gasket (13) over guide pins.

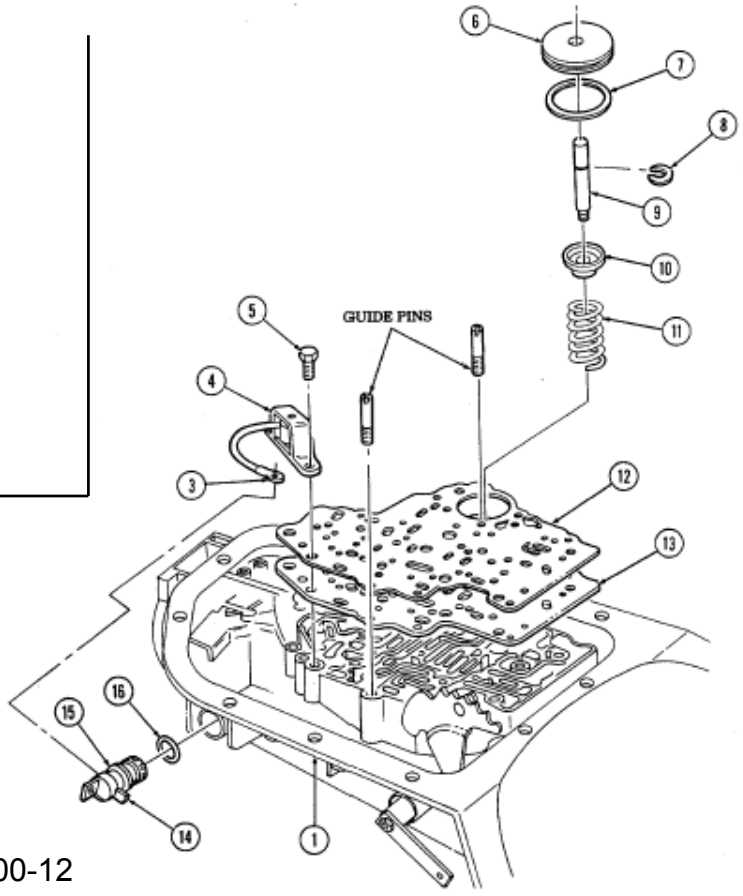
4. Install spacer plate (12) over guide pins.

5. Install detent solenoid (4) on spacer plate (12) with two capscrews (5). Do not tighten capscrews (5) at this time.

6. Install O-ring seal (16) on electrical connector (15). Align tab (14) on electrical connector (15) with notch in side of case (1) and install electrical connector (15) into case (1).

7. Connect detent solenoid lead (3) to electrical connector (15).





3L80 TRANSMISSION ASSEMBLY FROM SUBASSEMBLIES - Continued 0014

I. Front Servo

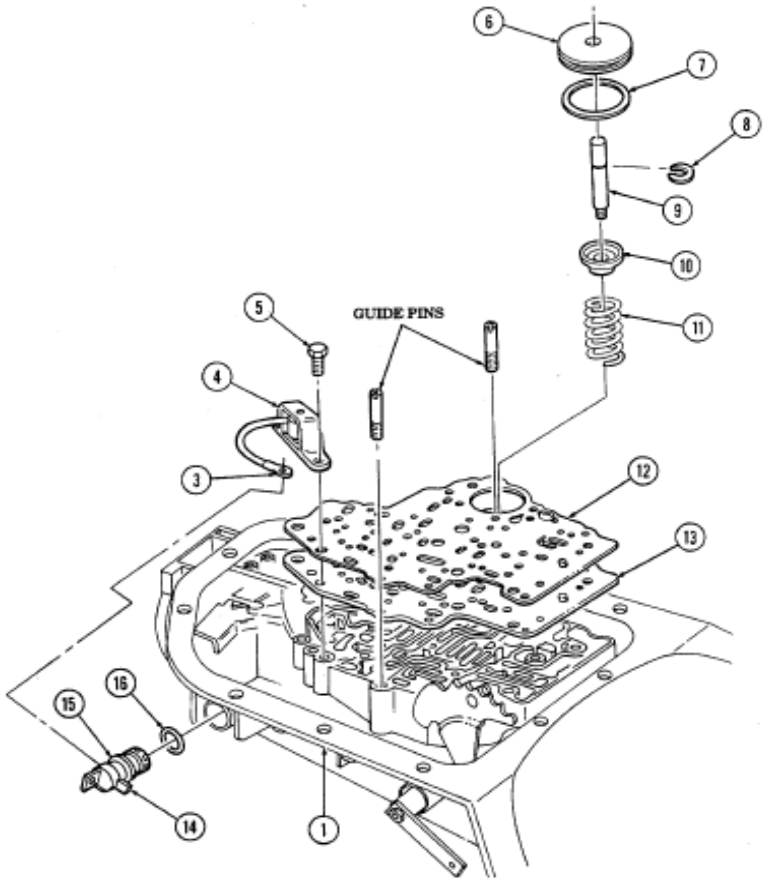
1. Install front servo spring (11) and spring retainer (10) into front servo piston bore in case (1).

2. Install retaining ring (8) in front servo pin (9) and install servo pin (9) in case (1) so that tapered end of servo pin (9) contacts front band.

NOTE

The teflon ring allows the front servo piston to slide very freely in case. The free fit of teflon rings is normal and does not indicate leakage. The teflon ring should only be replaced if it shows damage or evidence of leakage.

3. Install seal ring (7) on piston (6) if removed. Install servo piston (6), with flat side of servo piston (6) facing up, on servo pin (9).



3L80 TRANSMISSION ASSEMBLY FROM SUBASSEMBLIES - Continued 0014

m. Rear Servo

NOTE

Before installing rear servo, check for correct band apply pin, using band apply pin selector gauge. This is equivalent to adjusting the band.

1. Attach band apply pin selector gauge to case (3) using two rear servo cover capscrews (1). Do not tighten capscrews (1) at this time.

2. Install gauge pin into band apply pin selector gauge and into case (3). Check for freeness of gauge pin and tighten capscrews (1) to 15 lb-ft (20 N•m).

3. Apply 25 lb-ft (34 N•m) torque to lever on band apply pin selector gauge. Selection of proper rear band apply pin is determined by relation of flats on gauge pin to machined area (2) around hole on band apply pin selector gauge base.

4. Determine correct apply pin to be used from table below.

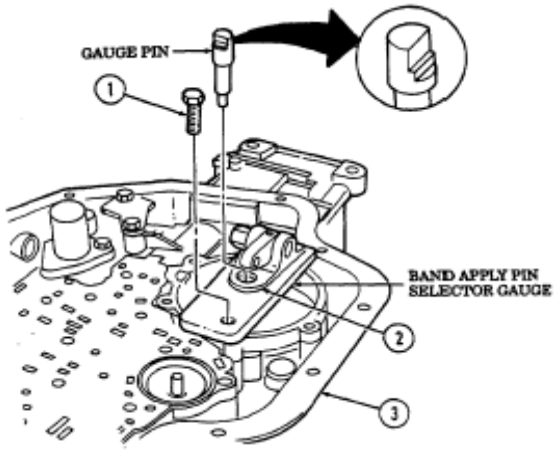
NOTE

- Apply pins are identified by the number of rings around small end of apply pins.
- If necessary to change apply pin, refer to servo repair, **WP 0012**.

Apply Pin Selection

a. If both flats are below gauge surface, install long servo pin identified by 3 rings.
b. If 1 flat is above gauge surface, install medium servo pin identified by 2 rings.
c. If both flats are above gauge surface, install short servo pin identified by 1 ring.

5. Remove band apply pin selector gauge from case (3).



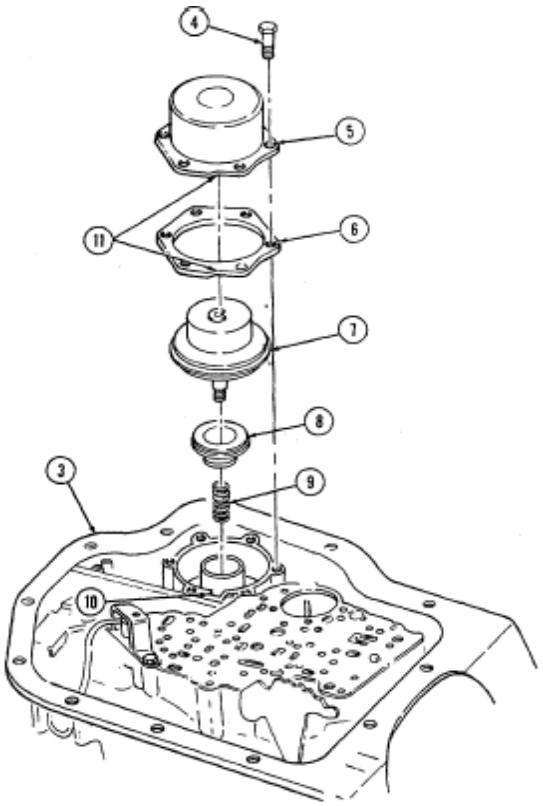
3L80 TRANSMISSION ASSEMBLY FROM SUBASSEMBLIES - Continued 0014

6. Install rear accumulator spring (9) in case (3).

7. Install accumulator piston (8) and rear servo piston (7) in case (3).

8. Align notch (11) on rear servo cover gasket (6) and rear servo cover (5) with oil feed hole (10) in transmission case (3).

9. Install rear servo cover gasket (6) and rear servo cover (5) on case (3) with six capscrews (4). Tighten capscrews (4) to 16-20 lb-ft (22-27 N•m).



3L80 TRANSMISSION ASSEMBLY FROM SUBASSEMBLIES - Continued 0014

n. Control Valve

NOTE

Control valve gasket is marked “VB”.

1. Install control valve gasket (7) over guide pins.

2. Install governor pipes (2) into control valve (6).

3. Install governor screen (1) open end first into governor feed pipe hole (14) (hole nearest center of transmission).

4. Install control valve (6) and governor pipes (2) over guide pins and onto case (13). Carefully align governor feed pipe (2) over governor screen (1) and index manual valve (9) with pin on detent lever (10).

5. Using wooden handle, lightly tap governor feed pipes (2) into case (13) until seated.

NOTE

Control valve is secured with eight 5/16-18 and three 1/4-20 capscrews.

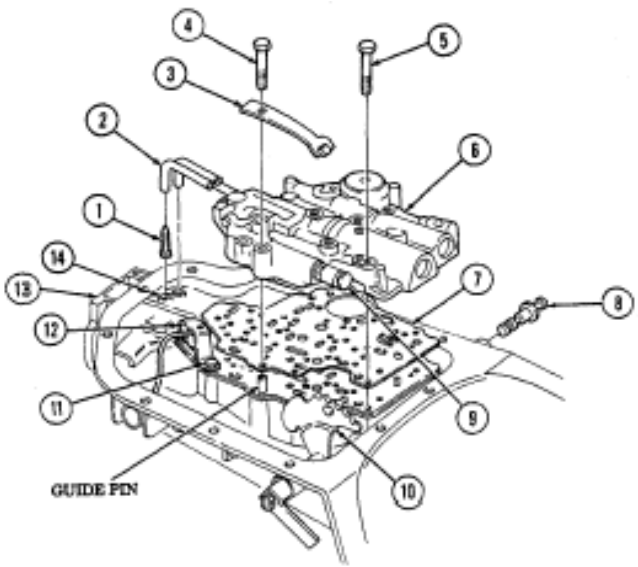
6. Install six capscrews (4) and three capscrews (5) securing control valve (6) to case (13).

7. Remove two guide pins from case (13).

8. Install detent roller and spring assembly (3) with two remaining capscrews (4).

9. Tighten eleven capscrews (4) and (5) on control valve (6), and two capscrews (11) on detent solenoid (12) to 8 lb-ft (11 N•m).

10. Install modulator valve (8) into case (13).



3L80 TRANSMISSION ASSEMBLY FROM SUBASSEMBLIES - Continued 0014

o. Governor

1. Install governor (23) into case (13).

2. Install cover gasket (20) and governor cover (21) on case (13) with four capscrews (22). Tighten capscrews (22) to 16-20 lb-ft (22-27 N•m).

p. Oil Filter

1. Install O-ring seal (24) on end of intake pipe (25) marked "case". Assemble end of intake pipe (25) marked "filter" into oil filter (18).

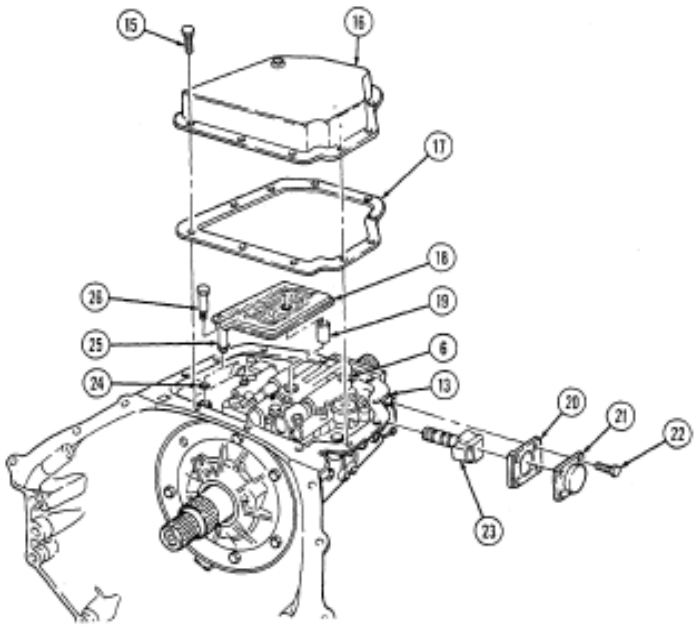
2. Install oil filter (18) and intake pipe (25) into case (13).

3. Install filter spacer (19) between control valve (6) and oil filter (18) with shoulder bolt (26). Tighten shoulder bolt (26) to 11 lb-ft (15 N•m).

q. Oil Pan

1. Clean oil pan (16). Refer to **Cleaning, WP 0002** for general cleaning instructions.

2. Install oil pan gasket (17) and oil pan (16) on case (13) with thirteen capscrews (15). Tighten capscrews (15) to 11-13 lb-ft (15-18 N•m).

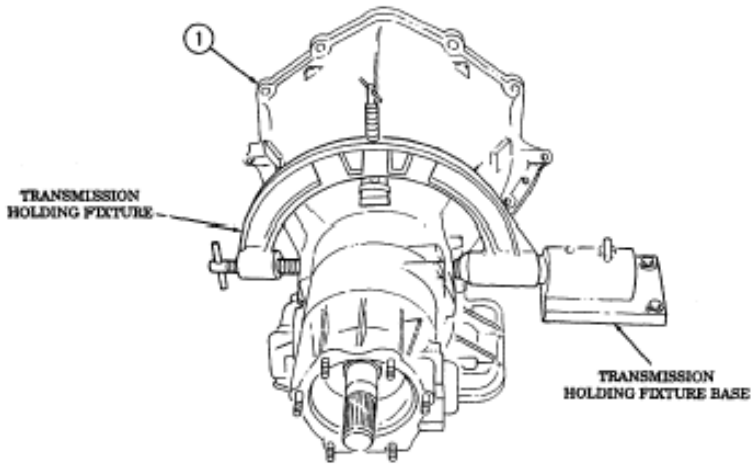


3L80 TRANSMISSION ASSEMBLY FROM SUBASSEMBLIES - Continued 0014

r. Holding Fixture

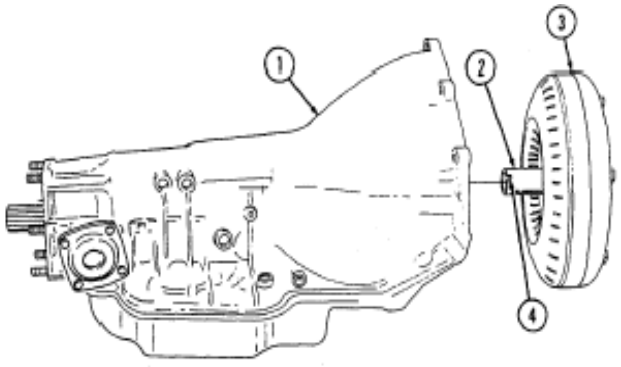
1. Remove transmission (1) and transmission holding fixture from transmission holding fixture base.

2. Remove transmission holding fixture from transmission (1).



s. Torque Converter

Install torque converter (3) into transmission (1). Be sure drive lugs of inner pump rotor are properly engaged with drive slots (4) of torque converter hub (2).



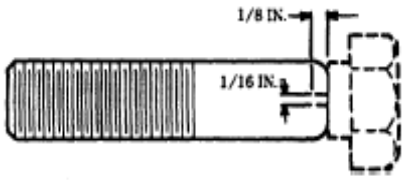
END OF TASK

TRANSMISSION GUIDE PIN 0015

THIS WORK PACKAGE (WP) COVERS:

Transmission guide pin fabrication

INSTRUCTIONS



1. Fabricate from screw, NSN 5306-00-226-4833.
2. Cut off head of screw.
3. Round off edge of non-threaded end as shown above.
4. Cut a slit approximately 1/16 in. wide and 1/8 in. deep in non-threaded end as shown above.
5. Remove any burrs after cutting.

END OF TASK

3L80 TRANSMISSION TESTING 0016

THIS WORK PACKAGE (WP) COVERS:

Test procedures

AFTER REPAIR TRANSMISSION PERFORMANCE SPECIFICATION

1. Rating

Input Torque (lb-ft)	Input Speed (rpm)	Input Horsepower
780	3000	250

2. Submergence and Environment Requirements

a. Description

The transmission was originally designed to meet the following submergence and environment requirements.

b. Submergence

1. The transmission must operate satisfactorily while immersed in water with the front input shaft centerline at a depth of 4.5 inches below the surface of the water.

2. Upon completion of the submergence requirements, the transmission lubrication shall be checked for water or water borne contamination per ASTM D95 and no more that 2% contamination allowed.

c. Environment

1. The transmission must operate satisfactorily in a temperature range of -50 degrees F to 160 degrees F.

NOTE

You are not required to perform any specific submergence or environmental tests. We expect the use of OEM and/or qualified after market gaskets and seals to achieve these requirements.

3L80 TRANSMISSION RUN IN TEST 0017

THIS WORK PACKAGE (WP) COVERS:

After repair transmission run in test

AFTER REPAIR TRANSMISSION RUN IN TEST

Test Fixture: Provide a test stand capable of the following:

1. A rotating power source capable of 260 lb.-ft of input torque at 2000 rpm.

2. Mount the transmission in a suitable test fixture capable of simulating actual vehicle installation. The test fixture should include all the equipment required to operate and monitor the test such as a Dynamometer, drive system, inertia disk, gages and probes. The combined inertia value of the dynamometer rotor and the inertia disk must be equal to 20.8 slug-ft^2. It shall also have a means to slowly brake output shaft from rotation to 0 rpm and lock output shaft stationary under load.

3. Controls to operate transmission lever, modulator assembly (GM part #8629943 or AC Delco # D6122), linkage detent solenoid, and 24V DC power supply to operate.

4. Oil cooler to provide cooling of transmission fluid.

5. Pressure gage, 0-300 psi, to monitor transmission line pressure.

6. Temperature gage to monitor transmission fluid temperature.

7. Oil dipstick (part #5582845) and tube (part #5582840) for fluid level checks. (A suitable substitute device may be used.)

FREE RUNNING TEST

1. Install transmission on test stand.

2. Install directional slide control (GM part # 8679943), "O" ring seal (GM part # 1054241), and modulator assembly on transmission and secure with retainer (GM part # 8627650) and bolt (part # MS90725-32).

3. Fill transmission with 11 quarts of Dexron II® or Dexron III®.

4. Conduct a free running, no load test by hand, rotating the torque converter and output shaft. Check for malfunctions, such as unusual noise or evidence of binding. All shafts should turn free and smooth.

5. Correct all deficiencies.

3L80 TRANSMISSION RUN IN TEST - Continued 0017

POWER TEST

1. Connect power source to torque converter:

CAUTION

Stop test immediately if fluid temperature exceeds 245.4 ° F. Correct malfunction before proceeding with test.

2. Place shift lever in neutral position.

3. Operate power source at 650 rpm while holding the output shaft stationary.

4. Move the shift lever through all operating ranges. Leave in drive as necessary to bring oil temperature to 190-200 degrees F, once at operating temperature return to neutral position.

5. Check fluid level and correct as necessary.

6. Move the shift lever to the drive position. Operate the power source at 2000 rpm, transmission must make 1-2 shift and 2-3 shift. Allow transmission to operate in third gear for one minute.

7. Reduce power source speed to 600 rpm. Apply 250 lb.-ft dynamometer load and slow output shaft speed to 0 rpm. 3-2 and 2-1 downshifts must occur. Remove load from dynamometer.

8. Check fluid level and correct as necessary. Reduce power source speed to 600 rpm. Move shift lever to low 2 position, forced downshift must occur. Move shift level to low 1 position, forced 2-1 downshift must occur. Increase power source speed to 1000 rpm and move shift lever to low 2 position, 1-2 shift must occur. Move shift lever to drive position, 2-3 shift must occur.

9. Reduce speed to 600 rpm. Place shift lever in neutral. Apply load to stop output shaft, remove load from output shaft.

10. Move shift lever to reverse position and increase power source speed to 2000 rpm. Transmission must operate in reverse for one minute. Reduce power source speed to 600 rpm, place shift lever in neutral, and apply load to slow the output shaft to 0 rpm.

3L80 TRANSMISSION RUN IN TEST - Continued 0017

11. Check transmission pressure.

a. Remove plug from line pressure port located on the left side of transmission forward of electrical connector.

b. Connect oil pressure gage to line pressure port.

c. Bring oil temperature to 190-200 ° F. reading. Pressure should be 55-70 psi.

d. Place shift lever in neutral and operate power source at 1000 rpm, note pressure reading. Pressure should be 55-70 psi.

CAUTION

Total running time for the next five tests should not exceed two minutes.

e. Lock output shaft stationary and place shift lever in drive, operate power source at 650 rpm, note pressure reading. Pressure should be 60-85 psi.

f. Lock output shaft stationary and place shift lever in drive, operate power source at 1000 rpm, note pressure reading. Pressure should be 60-90 psi.

g. Lock output shaft stationary and place shift lever in low 2, operate power source at 1000 rpm, note pressure reading. Pressure should be 135-160 psi.

h. Lock output shaft stationary and place shift lever in low 1, operate power source at 1000 rpm, note pressure reading. Pressure should be 135-160 psi.

h. Lock output shaft stationary and place shift lever in reverse, operate power source at 1000 rpm, note pressure reading. Pressure should be 95-150 psi.

i. Lock output shaft stationary and place shift lever in drive, operate power source at 1000 rpm, apply +24V DC to solenoid electrical connector, note pressure reading. Pressure should be 90-110 psi.

j. Allow output shaft to turn freely. Place shift lever in drive, operate power source at 2000 rpm, allow power source to gradually drop rpm and take pressure reading when power source is between 1200-2000 rpm. Pressure should be 55-70 psi.

12. Repeat free running test and note any changes that may have developed during power test. Listen carefully for any unusual grinding or binding.

3L80 TRANSMISSION RUN IN TEST - Continued 0017

LEAKAGE TEST

1. Fill transmission with Dexron II® or Dexron III® to .57 inches below filler pipe opening.

2. Connect transmission to air supply and close all openings.

    a. Apply a maximum of 2-1/2 psi internal air pressure for 15 minutes minimum.

    b. Observe for external fluid leakage. None allowed.

NOTE

The transmission must withstand a 2.5 (2 1/2) minimum psi internal pressure with no external fluid leakage. Failure to meet the above requirements shall be cause for rejection.

3. Remove unit from test stand.

END OF TASK

3L80 TRANSMISSION PACKAGING 0018

THIS WORK PACKAGE (WP) COVERS:

Transmission packaging, marking

PACKAGING

Packaging Requirements Sheet
(Special Packaging Instructions)
for
Transmission

2520-01-161-2136

Military preservation, packing, and marking for the item identified above shall be accomplished in accordance with the specific requirements identified below, all the applicable requirements of MIL-STD-2073-1D, and the Special Packaging Instruction contained in the TDP.

PRESERVATION: MILITARY
LEVEL OF PACKING: A
QUANTITY PER UNIT PACKAGE: 001

SPI NUMBER AK 11612136, REV H, Dated 05-25-94

Marking: In addition to any special markings called out on the SPI, all unit packages, intermediate packs, exterior shipping containers, and, as applicable, unitized loads shall be marked in accordance with MIL-STD-129N, including bar coding IAW ANSI/AIM-BC1, Uniform Symbology Specification Code 39.

This SPI has been validated and the method of preservation/packing has proven successful in meeting the needs of the military distribution system, including indeterminate storage and shipment throughout the world. Special instructions and/or tailoring of the SPI is detailed in the Supplemental Instructions in Paragraph D below. A prototype package is required to validate the sizes and fit requirements of the SPI. Minor dimensional and size changes are acceptable provided contractor provides the ACO with notification. Any design changes or changes in the method of preservation that provide a cost savings without degrading the method of preservation or packing or affecting the serviceability of the item will be considered and responded to within 10 days of submission to ACO. Government reserves the right to require testing to validate alternate industrial preservation methods, materials, alternate blocking, bracing, cushioning, and packing

.

3L80 TRANSMISSION PACKAGING - Continued 0018

SUPPLEMENTAL INSTRUCTIONS

An output shaft cover must be configured and/or manufactured as identified in 9146P3.C4. This cover must be installed in/on repaired transmission or damage will occur to transmission during shipment. Every effort should be made to reuse the anchoring brackets supplied with new transmissions to minimize packaging costs. There is not long life reusable container designed for this transmission.


9146P1.C4


9146P2.C4


9146P3.C4


9146P4.C4


9146P5.C4

Additional Packaging information can be found this Web site:

https://www-tdps.tacom.army.mil/PackagingHome.htm

NOTE

The guidance for downloading the IMAGE R & ADOBE ACROBAT viewers are on the Packaging Website. If you do not have the IMAGE R and ADOBE ACROBAT viewers open the website, go to the Packaging Database Query, click on the "Need Help?" button. The instructions for downloading the viewers are in Paragraph 2.

You can determine the format of the registration card. It must include, as a minimum, the following information.

Repair Site Control Number _____
Military Interdepartmental Purchase Request (MIPR) _____
Repaired Transmission Number (starting with number 001): _____
Repair Date _____

Each transmission will have a data plate with serial number. If transmission still has original dataplate, leave in place. If not, assign a new serial number and apply dataplate to transmission housing.

END OF TASK

3L80 TRANSMISSION MANDATORY REPLACEMENT PARTS 0019

THIS WORK PACKAGE (WP) COVERS:

Mandatory Replacement Parts

Contents of Kit
NSN 5330-01-086-5457 / PN # 24204440 (*) are included in this kit
(Provided by 3L80 Trans Mfg. – GM Corp.)

GM Part #	QTY	PART NAME
24210386	1	Filter Asm-A/Trans Oil
08623174*	1	GASKET-LOW & REV BAND SERVO
08623430*	1	SEAL-LOW & REV BAND SERVO PSTN
08623978*	1	GASKET-A/TRNS O/PMP
08624709*	1	GASKET,A/TRNS CASE EXTN
08626356*	1	RING-FWD CLU HSG OIL SEAL
08626423*	1	SEAL,MAN 2-1 BAND SERVO PSTN
08629956*	1	POSU INSTRUCTION,A/TRNS REPAIR
08645905*	1	POSU SEAL KIT,A/TRNS OVERHAUL
24210605*	1	SEAL-A/TRNS O/PMP (O RING)
08655031*	1	SEAL,CASE EXT (FOA)
08655280*	1	BOLT/SCREW-A/TRNS O/PMP
08655625*	1	GASKET-A/TRNS OIL PAN
08670283*	1	SEAL ASM-T/CV OIL
08670381*	1	GASKET-GOV CVR
08670392*	1	GASKET,C/VLV BODY SPCR PLT
08670393*	1	GASKET,C/VLV BODY SPCR PLT
08670447*	1	GASKET-C/VLV BODY
08670458*	1	GASKET-C/VLV BODY SPCR PLT
08677582*	2	POSU SEAL-FWD CLU PSTN INR
08677583*	2	POSU SEAL-FWD CLU PSTN OTR
24209225*	2	POSU SEAL-DIR CLU PSTN INTER
08686966*	1	POSU PLATE ASM,INTER CLU
24202646*	11	PLATE ASM-FWD CLU
24202360*	1	SEAL-INTER CLU PSTN INR
24202361*	1	SEAL-INTER CLU PSTN OTR

NSN	QTY	PART NAME
2520-01-164-7234	1	Torque Converter
3120-01-166-3677	1	Bushing
5365-01-085-0910	1	Bushing (oil pump)

NOTE

Transmissions being repaired/included for HMMWV Recapitalization process will add the transmission mount as an additional Mandatory Replacement Item. It is: Mount, Resilient, NSN 5342-01-190-7735, PN 5589134